Dental Abstracts

a selection of world dental literature

AMERICAN DENTAL ASSOCIATION

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AMERICAN DENTAL ASSOCIATION

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2. To provide, by a few hours' reading each month, a survey of the significant advances being made by dentistry throughout the world, as reflected in current dental literature; and

3. To supply enough data in each abstract so that the reader may determine whether he wishes to refer to the original article for more complete information.

The abstracts are grouped in broad classifications. The specialist will learn from this periodical of work done in other fields as well as in his own. The general practitioner will be able to keep abreast of modern knowledge in the various specialties. Articles from which abstracts have been made are on file in the Library of the American Dental Association and may be borrowed by members of the Association. Requests for articles should be addressed to the Bureau of Library and Indexing Service, American Dental Association, 222 East Superior Street, Chicago 11, Illinois. Only three articles may be borrowed at one time, and they may not be kept longer than one week. No charge is made to Association members for this service.

Periodontics and endodontics

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Periodontics

The management of the alveolar bone in the treatment of the periodontal pocket

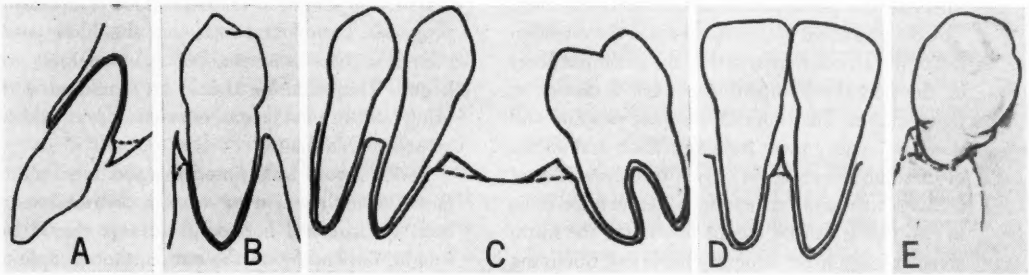
Fermín A. Carranza and Fermín A. Carranza, Jr., Buenos Aires. *J. Periodont.* 27:29-35 Jan. 1956

One of the most controversial problems in the treatment of the periodontal pocket is that of the management of the bony margin. Present knowledge of bone pathology in periodontal disease seems to indicate that the bone is not affected beyond repair and that, consequently, in pocket elimination, bone should not be exposed, much less removed. If the goal of the treatment, however, is the complete elimination of the pocket, in intra-alveolar (infrabony or subcrestal) pockets, the operator confronts a choice—to leave the bone intact and attempt to obtain reattachment, or to remove bone as part of the over-all elimination of the pocket.

It is concluded from a review of the literature that in certain instances it is necessary to expose and remove bone.

Figure 1 Photomicrograph of an intra-alveolar pocket. The form of the alveolar crest changes and the fibers alter their direction and lose their function

Figure 2 Instances in which bone removal does not mean a sacrifice of useful bone: A and B, in buccal and lingual surfaces; C, in proximal surfaces when the adjacent tooth is missing; D, in interdental bony spurs, and E, in interdental bony troughs



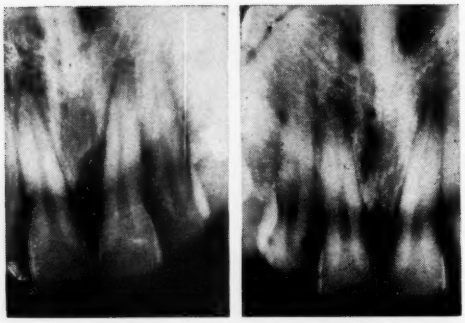


Figure 3 Alveolar crest before and after bone regeneration

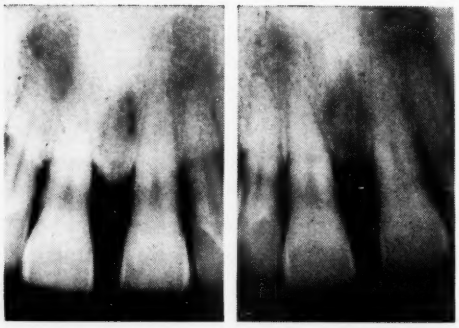


Figure 4 Alveolar crest before and after remodeling by surgical osteoplasty

Bone removal is indicated in the following instances: (1) in intra-alveolar pockets where the removal of bone does not entail a sacrifice of useful bone for the affected or adjacent tooth; (2) in intra-alveolar pockets along proximal surfaces when the removal of bone is indispensable to eliminate the pocket, even when this means the removal of useful bone; (3) in supra-alveolar pockets when there are pronounced differences in the height of the crestal bone, thus favoring a recurrence, and (4) in bifurcation or trifurcation involvements, to permit a good cleaning of the space.

When bone regeneration cannot be attained, bone removal is indicated in the treatment of a periodontal pocket for one or more of the following reasons: (1) the lateral wall of the pocket includes bony tissue; (2) recurrence is almost certain, and (3) the alveolar crest must be remodeled in order to get a functional restitution of the fibers attached to it.

In intra-alveolar pockets the extrusive movement of the tooth increases, and is stopped only when the direction of the underlying oblique fibers of the periodontal membrane is reversed. The desired result of the treatment is the remodeling of the alveolar crest so that the principal fibers of the periodontal membrane have a chance to regenerate in their normal anatomic position and thereby recover their function. Such restoration of these fibers can occur only if the alveolar crest recovers its normal structure, which may be done in two ways: (1) by completely filling the intra-alveolar breach by bone regeneration, obtaining a biologic remodeling of the crest, or (2) by surgical elimination of the eroded segment of bone, to obtain a plastic remodeling of the crest.

A conservative attitude must govern bone removal; the goal of the treatment should be the eradication of the pocket and the reshaping of the alveolar crest, with a minimum sacrifice of bone structure.

The role of jacket crown and fixed bridge restorations in the prevention and treatment of periodontal disease

Charles L. Pincus. *J.South.California D.A.* 24:19-25 Feb. 1956

From the periodontist's viewpoint, fixed bridgework is the choice wherever possible. Rigid fixation establishes reciprocal support to the abutments, reduces leverages and abnormal stresses, and restricts the excessive tooth movements which exacerbate local inflammatory processes. A thorough diagnosis is essential for a successful prognosis. Periodontal treatment should be completed, in most instances, before restorations are begun. The occlusion should be equilibrated to bring all traumatogenic external forces within an acceptable range.

Teeth should be splinted for additional abutment strength and a more even distribution of both vertical and horizontal stresses should be sought, depending on the circumstances. Splints

would be unnecessary in the mouth of a 55 year old patient showing little bone resorption and firm teeth, but would be necessary in the mouth of a 35 year old patient showing a one-third loss of alveolar bone height and mobility of the teeth.

If periodontal disease is advanced, the abutment of choice is full coverage by cast crowns. Three-quarter crowns may be used where the teeth have good contour and there is no buccal or labial erosion or decay present.

In fixed bridge restorations, occlusal tables should be narrowed buccolingually. In addition, the gingival shoulder of the preparation should be extended almost to the base of the gingival sulcus and the crown built up from there to give support (not pressure) to the tissue of the remaining pocket.

In the prevention and treatment of periodontal disease, care must be taken not to injure the gingival tissue; toothbrushing habits should be corrected, and dietary habits checked to assure that the patient receives sufficient proteins, vitamin B complex and vitamin C.

The use of the Minnesota multiphasic personality inventory as a diagnostic aid in periodontal disease—a preliminary report

Samuel Charles Miller, Jack L. Thaller and Alexander Soberman. *J.Periodont.* 27:44-46 Jan. 1956

A disturbed psyche can and does alter the static composure of the body. There may be a positive correlation between periodontal disease and the anxiety neurosis. A study of this possibility was undertaken, utilizing the Minnesota Multiphasic Personality Inventory. This psychometric test is designed to provide information on the more important phases of personality, including the anxiety neurosis.

The M.M.P.I. was administered to 50 patients at the New York University College of Dentistry who had been examined by the department of periodontia and oral medicine and whose condition was diagnosed as periodontal disease. The median score obtained was 19.5, compared with a median score of 13.2 obtained by 1,971 students at the State University of Iowa and a median score of 33.9 obtained by 103 patients at a state psychiatric institute.

An attempt was made to see if a possible relation might exist between the rapidity of bone degeneration and the degree of anxiety existing in the 50 patients at New York University. The patients were classified according to slow or rapid alveoloclasia. The correlation between rapidity of bone loss and the degree of anxiety is questionable. There is apparently a positive correlation between the anxiety state and periodontal disease. Study of the problem is continuing.

Orthodontic procedures in the care of the periodontal patient

Max Shapiro. *J.Periodont.* 27:7-15 Jan. 1956

Frequently in periodontal treatment it is necessary to use procedures from other specialties, among which are simple procedures borrowed from the orthodontist. Migration of the anterior teeth, a deep overbite, malalignment of teeth or other conditions of malocclusion often are features of periodontal disease which must be corrected for successful periodontal therapy.

Eight case histories illustrate how readily upper or lower anterior or posterior teeth can be moved mesially, distally, lingually, labially or buccally. The age of the patient apparently is not a factor in orthodontic movement. Simple orthodontic procedures can be carried out with success at any age. There is little clinical difference in the rate of movement of teeth at different ages. Teeth should not be moved if inflammatory conditions are present in the gingiva, since excessive bone destruction might ensue as a result of additional resorptive forces being placed on the alveolar bone.

In the instances described, the teeth were retained in final position for periods up to one year. Retention was obtained by several methods, including grassline or wire ligatures used in temporary splints; cast fixed or removable splints, and acrylic appliances.

It appears that movement of teeth benefits the periodontal condition. The most severe instances of periodontal disease seem to respond better to treatment when movement is required than when

no movement is necessary. Pocket depths and mobility do not seem to influence the results, tooth movement having been accomplished on teeth presenting severe mobility and deep pockets. The combination of the stabilizing influences of the splinting procedures and the stimulating influence of the orthodontic forces may be desirable.

Orthodontic treatment may be of value to the periodontal patient if it achieves a more harmonious relation between the adjacent teeth in each jaw, and between the teeth in opposing jaws; facilitates restorative procedures, and increases the value of the teeth to the patient by improving their appearance, which thus encourages the patient to devote the time and effort required to maintain them in health.

The treatment of desquamative gingivitis

Harry Roth and Ira Franklin Ross. *Oral Surg., Oral Med.& Oral Path.* 9:391-402 April 1956

Desquamative gingivitis is a relatively uncommon chronic disease of the gingiva, characterized by varying degrees of diffuse erythema of the gingival mucosa. The clinical pattern varies from areas of discrete redness to diffuse hemorrhagic areas with bullae. The most frequent sites are the labial and buccal surfaces of the upper and lower anterior teeth. The outstanding subjective observations are pain, burning and bleeding on the slightest pressure. The disease is seen most frequently in women either directly prior to or during the menopause, although it may occur in either sex at any time between the ages of 17 and 60 years.

The literature is reviewed and four cases are reported. Treatment consisted of dietary correction (foregoing refined flour and sugar products and adherence to a diet of the seven basic foods); multivitamin preparations, desiccated whole liver, and progressively stimulating gingival massage, beginning with rubber cups and soft-textured bristle brushes and progressing to hard-textured bristle brushes. All patients responded favorably, objectively and subjectively.

All four patients at the outset manifested a fear of toothbrushing because of the anticipated pain and bleeding. When both pain and bleeding diminished with treatment, each patient developed self-confidence and cooperated more fully in her toothbrushing efforts. It was noted during treatment that illness, improper toothbrushing, lack of adherence to the prescribed diet, and any intervening emotional upset produced a limited recurrence of the initial clinical symptoms.

The number of cases treated is too small to draw any final conclusions. The treatment seems to merit further investigation. The therapeutic agents employed are well tolerated and cause no side effects. It is possible that smaller doses of the vitamin preparations, and other constituents of the vitamin complexes, may produce a satisfactory result. In future investigations, modified multivitamin dosages or perhaps individual vitamins may be tried.

The effect of single and multiple toothbrushing in the cleansing of the normal and periodontally involved dentition

Henry M. Goldman. *Oral Surg., Oral Med. & Oral Path.* 9:203-204 Feb. 1956

To determine the effect on the cleanliness of the teeth, a study was undertaken to ascertain the benefits of single as opposed to multiple daily toothbrushings.

Three groups of subjects were selected. The first consisted of eight persons with intact dentitions and healthy gingivae; the second, of 12 persons with complete but periodontally involved dentitions (these had been treated periodontally), and the third, of six persons with the same dentitions as those in group 2, but who had not been treated periodontally. All were taught the modified Stillman-McCall toothbrushing technic. They were directed to brush one side of the mouth once daily, and the other side three times a day—before breakfast, after lunch and after dinner. The experiment lasted two months.

Examination of the eight subjects with healthy dentitions showed no obvious changes on either side. All teeth were free from debris. Even disclosing solution revealed no differences in the two sides.

The group of persons who had been treated for periodontal disease showed pronounced differences between the side brushed a single time and the one brushed three times daily. Debris, materia alba and food lodgments were present to a far greater degree in the former. The group affected by periodontal disease, but untreated, had essentially the same results as the second group.

In healthy mouths, it was concluded, single brushings effect as complete cleansing as do multiple brushings. When periodontal disease is present, however, a single brushing is not sufficient. Healthy mouths do not tend to produce materia alba; periodontally involved mouths have little self-cleansing ability, and must be brushed three times daily in order to keep the teeth and gingivae relatively clean.

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Endodontics

Root therapy and curettage in anterior teeth

(Conducterapia y curetaje en dientes anteriores)

J. A. Camara. *Rev.D.DominicanRep.* 7:12-14 June 1955

A technic for endodontic treatment of anterior teeth by which the operation can be performed in one hour for each tooth with highly satisfactory results consists of the following procedures. After a routine examination, the patient is given a capsule containing 5 grains aspirin and 0.5 grain phenobarbital sodium. He then is given an infraorbital injection of 2 cc. of an anesthetic solution, and a topical anesthetic ointment is applied to the buccal mucosa. Mesiodistal cavities, if any, should have been filled previously. Access is gained to the pulp chamber through the cingulum by means of burs, no. 568, 569 and 570.

The pulp chamber is enlarged with diamond points and cleared of all pulp material to gain access to the root canal. The canal is enlarged with reamers no. 6 and 7, cleared of all root material and washed with alcohol, dried with cotton and air and sterilized several times with phenol for 15 minutes. The root canal is filled as follows:

1. A sterile canal reamer rolled in sterile cotton is introduced into the canal and forced with pressure to the apical region and then removed. This procedure is repeated a second time, using a fresh canal reamer rolled in cotton each time. A silver wire, the size of the reamer, is introduced in proper position into the root canal and a roentgenogram taken. If the film shows that the silver wire is in the correct position with its point at the apex, the wire is fixed to the crown of the tooth in that position by means of hemostatic pliers. A mark is made on the wire showing the extent of its penetration in the root canal; this is the length to be given to the filling. Then the wire is removed and the root canal is lubricated.

The filling is made with three portions of zinc oxide-eugenol-dithymol-diiodide of different consistencies—thin, thick and thicker—which are introduced in the canal under pressure. The silver wire is again introduced into the already filled root canal up to the mark, and a roentgenogram is taken immediately. At this point in the operation the patient is given two injections of 1 cc. each of an anesthetic solution near the tooth under treatment, one in the labial region and the other in the palatine region. If the roentgenogram shows thorough filling of the canal up to the apex, the silver point is retained in good position, the free end of the wire is cut, and the silver point is forced into the canal by pressure. The margins of the pulp cavity are cleansed and the cavity is filled with plastic material of the proper color.

2. The aseptic table of the dental unit is replaced by a sterile tray containing the necessary surgical armamentarium and gauze, cotton, phenol and sulfonamides. The operative field is sterilized. A deep incision is made in the gingiva from the apical third of the tooth under treatment to the apical region of the tooth next to it. By opening the borders of this incision, the cavity of the abscess is seen. If it is not visible, a slight rotation of the surgical bur around the apical region causes the bur to enter the cavity. The borders of the incision are then widened. The cavity of the abscess is cleared of all periapical necrotic tissue and of the excess of the filling substance remaining in the cavity. Phenol is applied to the borders of the incision to promote immediate healing of

the wound, and sulfonamide is powdered into the wound.

The operation is simple and free from complications 95 per cent of the time. Excessive bleeding may occur but is of no significance as it soon stops.

Bacteriologic checking during root treatment and root resection

(Bakteriologisk kontroll vid rotbehandling och rotspetsresektion)

D. Eklöf. *Svensk tandläk.Tskr.* 48:195-222 Sept. 1955

Bacteriologic control in endodontic treatment is well established. Tests from the root canal which show a bacteria-free condition do not prove, however, that the tissues of the root have been completely disinfected. The penetration, and thus the efficiency, of the medication in the apical and periapical region remains an unknown factor. In this investigation the effect of a 10 per cent solution of chloramphenicol in propylene glycol was studied in 48 vital teeth with roentgenographically observable periapical conditions ranging from thickening of the periapical contour to cherry-sized destructions.

Cultures from the root canals were compared with those produced from apical sections obtained by root resection. Only front teeth were included in the study. The average age of the patients was 34 years. For control purposes the bacterial flora of 12 untreated gangrenous teeth was studied. Ascites-dextrose, Brewer thioglycolate, and brain-heart-infusion broth were used for the bacteriologic cultures. Clinical observations included registration of periodontal reactions during and after treatment, and, also, of gangrenous smell. Details of the technical procedure and of identification of the bacterial flora are given.

An average of two treatments was necessary to yield negative cultures. Pain and facial swelling was seldom observed after treatment. In some instances a gangrenous smell prevailed in spite of negative cultures from the root canal.

In 31 instances samples were taken from the apical and periapical tissues through the external alveolar plate after the root canals had yielded negative cultures. Ten samples from granulomas (32 per cent) and nine samples from apexes (29 per cent) yielded positive cultures. In 12 control patients, samples were taken in the same manner as from untreated pulpless teeth. Of these nine samples from granulomas (75 per cent) and 11 samples from apexes (92 per cent) yielded positive cultures.

In one patient, chloramphenicol-resistant organisms were found. The results indicate that generally the treatment is effective in the apical-periapical region. Because of the possibility of contamination during sampling, the sources of the positive cultures (about 30 per cent) may not in all instances have been undestroyed germs from this region.

The aim of root canal treatment should include the removal and destruction of toxic components of the organic substances in the root canal. Chloramphenicol has no such effect; this may explain the fact that a gangrenous smell sometimes persisted in spite of negative culture.

Bleaching pulpless teeth: selection of cases

Michael Elucyk. *J.Ontario D.A.* 33:24-25 Feb. 1956

To bleach a discolored tooth successfully, all the silicate, plastic and metallic restorations must be removed from the crown of the tooth. The results are only relatively permanent. Discoloration caused by products of pulp decomposition or food debris is bleached readily, but discoloration caused by metallic salts may be bleached only with difficulty or not at all.

A 30 per cent solution of hydrogen peroxide is used as the bleaching agent in the following procedure:

1. Surface stains on the tooth are removed through regular prophylactic measures.

2. All fillings and root fillings to a line 2 to 3 mm. below the level of the gingival margin are removed.

3. The surface of the pulp chamber is freshened, and all visible surface stains are removed, with a large round bur.

4. Soft tissues around the tooth are coated with petroleum jelly.

5. A rubber dam is applied only over the tooth to be bleached, and tied securely with a double ligature to prevent leakage of the bleaching agent. For further dam retention, a double anterior wing clamp is used.

6. The patient is covered with a plastic cape.

7. The pulp chamber is dehydrated by swabbing with a solution of 1 part chloroform and 3 parts ethyl alcohol and is dehydrated by blasting with hot air.

8. A cotton pellet is saturated with 30 per cent hydrogen peroxide solution and placed in the pulp chamber. The hydrogen peroxide is forced into the tubules with an orangewood stick and unvulcanized rubber, and held under pressure for one minute.

9. Cotton pellets are placed in the pulp chamber and over the labial surface of the tooth, and saturated with hydrogen peroxide solution released through a curved glass dropper.

10. The eyes of the patient are covered with a towel.

11. A no. 1 photoflood light in a reflector is focused on the tooth at a distance of 20 inches. The bleaching is caused by the heat of the lamp, not just by the light.

12. Drops of hydrogen peroxide solution are added to the surface of the tooth from time to time.

13. After five minutes the light is turned off, the cotton removed, the tooth dried, and cotton is reinserted in the tooth and saturated with hydrogen peroxide solution.

14. The process is repeated for from four to six periods of five minutes each for a total of 20 to 30 minutes.

15. The canal is dried and a pledget of cotton moistened with hydrogen peroxide is sealed in the canal with a double seal of temporary stopping and cement.

16. If necessary the treatment is repeated in one week.

17. To restore translucency, the tooth is dehydrated with alcohol and warm air and the chamber is flooded with an 80 per cent solution of chloral hydrate which is forced into the dentinal tubuli by means of unvulcanized rubber and an orangewood stick. Grossman suggests that a silicon fluid, instead of chloral hydrate, be used to restore translucency.

18. To seal the tubuli and to decrease the permeability of the dentin and the enamel, a 2 per cent solution of sodium fluoride is applied, followed three or four minutes later with a 2 per cent solution of calcium chloride which may be sealed with acrylic monomer.

19. The pulp chamber is dried and varnished with a clear, colorless varnish.

20. The permanent restoration is inserted, using a rubber dam.

Prosthetic dentistry

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Crown and bridge

Crown morphology in relation to operative and crown and bridge dentistry

Louis G. Terkla. *Oregon D.J.* 25:2-10 Dec. 1955

When lost or diseased tooth structure is replaced, proper crown structure must be reproduced. The normal labial, lingual and interproximal contours of the teeth are protective and perform the functions of (1) holding the gingival tissues around the teeth under slight tension, which maintains tissue tone, (2) protecting the gingival tissues by partial deflection of food and (3) stimulating the gingival tissues by allowing light, frictional massage with passing food products during mastication.

The reproduction of these contours is especially important in the construction of full and three-quarter cast crowns and in the restoration of the labial and lingual cervical thirds of the teeth. Failure to restore proper contour on a gold crown or gingival restoration will lead to injury of the gingival tissues by food products during mastication. This, combined with the lack of proper stimulation and maintenance of tissue tone, will cause pocket formation with subsequent periodontal destruction and tissue recession.

Too much contouring of the labial and lingual surfaces will result in overprotection of the gingival tissues and the harboring of food products beneath the crests of the contours.

When the proximal surfaces of the teeth are viewed labiolingually, each displays a definite convexity from the contact area to the cervical line occlusogingivally, and from the labial to the lingual surfaces. This contouring, along with good contacts, maintains the tonus of the gingival papillae which normally fill the interproximal spaces. This contour is replaced easily in carving indirect wax patterns for crowns and inlays. The operator may find it more difficult to replace these contours in restoring teeth with silver amalgam, gold foil and direct inlays. A few extra minutes spent with the adjustment, contouring and wedging of a matrix band will solve this problem for silver amalgam. Correct inlay contour may be achieved by the addition of low fusing wax to the proximal surface of the direct wax pattern after spruing.

If interproximal contours are normal, the positive contact of each tooth with adjacent teeth will protect the gingival tissue or papillae which lie between them. This is accomplished by keeping food from packing between the teeth and by stabilizing the dental arch. The latter requires the combined positive contacts of all the teeth to prevent drifting and malocclusion.

In an average arch, the contact areas on upper posterior teeth, as seen from the occlusal aspect, begin slightly labial to the middle third of the bicuspids and gradually move lingually to the middle third between second bicuspid and first molar, and to the lingual side of the middle third between the molars. These contact areas average 1.5 to 2 mm. in diameter for posterior teeth.

If the upper teeth are viewed incisogingivally and occlusogingivally from the labial aspect, contacts will appear in the incisal third between the central incisors and near the junction of the incisal and middle thirds between central and lateral incisors and between lateral incisor and cuspid. The contact area between cuspid and first bicuspid shifts to the middle third and then, between the bicuspids and between the second bicuspid and the mesial aspect of the first molar, the contacts lie in the occlusal third. The contacts between the molars then shift to the middle third of these teeth.

The mandibular teeth, viewed incisogingivally and occlusogingivally, present a more uniform location of contacts. The incisor contacts are all located at the incisal third. From the distal aspect of the cuspid to the mesial aspect of the first

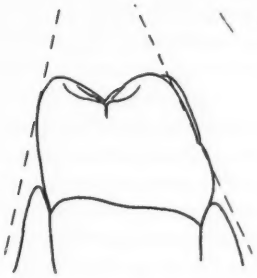

Figure 1 The normal contours of a lower first molar, showing the approximate deflections of food products labially and lingually. (Illustration courtesy of J. M. Ney Co., Ney Bridge and Inlay Book)

Figure 2 An undercontoured full cast gold crown, showing the direction of food products which traumatize the gingival margins. (Illustration courtesy of J. M. Ney Co., Ney Bridge and Inlay Book)

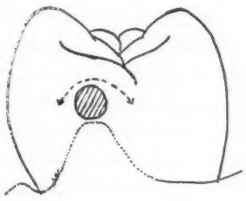

Figure 3 The relationship of the contact area to the gingival papilla. The arrows indicate the direction of food products around the contact area

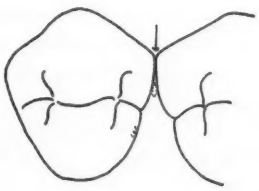

Figure 4 A contact placed too far labially will expose the tip of the gingival papilla to trauma during mastication

Figure 5 An over-contoured cast gold crown, showing over-protection of the gingival tissues

molar, the contacts appear in the occlusal portion of the middle third. The molar contacts shift to the center of the middle third occlusogingivally.

The contacts, combined with the normal contours of interproximal surfaces, form four embrasures. These embrasures function as spillways for the escape of food from the occlusal surface and make the tooth more self-cleansing.

A contact placed too close to the occlusal surface may reduce the size of the occlusal embrasure to such a degree that food impaction occurs interproximally instead of allowing the self-cleansing excursion of food products past the contact. A contact placed too far gingivally will either increase the width of or deepen the occlusal embrasure. Either of these conditions will cause a wedging of food in the contact area with eventual injury to the gingival papilla. A contact placed too far labially will decrease the size of the facial embrasure, invite food impaction, and reduce the frictional stimulation to the labial portion of the gingival papilla. A contact placed too far lingually will open the facial embrasure abnormally and will allow traumatic injury to the labial portion of the gingival papilla.

The simple replacement of lost tooth structure, without regard for the production of functional anatomy and contours, is crude dentistry which ultimately leads to destruction of the periodontium.

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Partial dentures

Removable partial prosthesis

(Prótesis parcial removible)

O. Schnaidt H. *Rev.dent.Chile* 45:691-698 July-Aug. 1955

The purpose of a partial prosthesis is to restore normal function of mastication in order to prevent further loss of teeth and resorption of the alveolar bone. A thorough examination is made of the remaining teeth, the mandibular and maxillary bones and the mucosa. Roentgenograms of the teeth and jaws are taken to determine the ability of these structures to withstand the stress of mastication. A study model is prepared, mounted in an articulator, and used as a guide for any procedure or surgical intervention which may be needed in preparing the dental arches to which the prosthesis will be secured.

Dental arches are classified in three groups according to Wild's classification which includes: (1) contracted arches, caused by the loss of posterior teeth, unilaterally or bilaterally; (2) interrupted arches, caused by the loss of intermediate teeth, and (3) combined contracted-interrupted arches.

Three types of prostheses are considered:

1. Tooth-borne prostheses are indicated for Wild's second classification of interrupted arches, provided that the gaps are produced by the loss of no more than two or three teeth and that the remaining teeth are in a satisfactory condition. The problem is solved by means of one or two tooth-borne saddles, joined to the retentive component of the prosthesis by a connector which can be either metallic or plastic.

2. Tissue-borne prostheses which have the retentive component in the remaining teeth are indicated in instances of dental arches of Wild's first classification and also in instances of the second classification if the remaining teeth are incapable of withstanding a heavy load or if the gaps are large and tooth-borne prostheses cannot be applied. The gingival tissues are used for support. The functional results are satisfactory, although the efficiency of mastication is diminished because of the resilience of the mucosa.

3. Combined tooth-borne and tissue-borne prostheses are indicated for dental arches of Wild's third classification, if the gaps are caused by the loss of one and no more than two teeth provided that the remaining teeth are healthy. The load should be distributed in the tooth-borne and tissue-borne regions of the prosthesis. The two components of this type of prosthesis function independently as tooth-borne and tissue-borne prosthesis, respectively. The function of either component of the prosthesis is regulated by stress-breakers and resilience links interposed at convenient distances between the saddles and the retentive components of the prosthesis. By these devices, the saddles become disconnected from

the retentive component of the prosthesis during mastication and reconnect when the prosthesis is at rest, thus preventing or minimizing the stress of mastication on the abutment. The construction of a removable partial prosthesis according to the types of dental arches of Wild's classification is not always possible. It is feasible when the biostatics of the supportive buccal structures are normal. Otherwise a tissue-borne prosthesis is preferred.

The proper zones in the abutment which should carry the retentive components of the prosthesis to prevent its lateral displacement are illustrated. Drawings of the pattern of loss of teeth according to Wild's classification are reproduced. The therapeutic aim of the use of a removable partial prosthesis in restoring mastication and esthetics is obtained if (1) the prosthesis does not harm the supportive hard and soft buccal tissues, (2) if the prosthesis possesses sufficient flexibility so that the patient can remove it and replace it comfortably, and (3) if the prosthesis is stable with regard to the normal forces of traction.

▼ Complete dentures

Use of hyaluronidase for extractions in patients requiring immediate dentures

Frank C. Carothers. *J.Oral Surg.* 41:122-128 April 1956

Immediate insertion of dentures to preserve a normal appearance is insisted on by nearly every patient after extraction of the anterior teeth. This presents problems because of postoperative swelling and trismus, traumatic edema, hematoma and stiffness of the face and jaws.

Hyaluronidase, an enzyme derived from testicular extract, is a "spreading factor"; by temporarily liquefying the natural barriers, hyaluronidase opens pathways in the tissues for free diffusion and consequent absorption of fluids.

Anterior teeth were extracted, usually from both jaws, in 62 patients, 61 under local anesthesia and one under general anesthesia. Hyaluronidase was added to the local anesthetic, or infiltrated about the teeth when the general anesthetic was used. In the majority of the patients, antibiotics were administered one hour before and 24 hours after the operation. Sedatives were administered if necessary. A control series of 31 patients was also studied.

Anesthesia was rapid in onset and of adequate duration. Less of the anesthetic solution was required in the control patients. Immediate swelling, ballooning and distortion of the face and oral tissues were almost completely eliminated; there was no postoperative edema or hematoma, and no pain, or very little, in most instances. Healing time was reduced. Snugly fitting dentures were inserted immediately, with little irritation of the gingiva or stiffness of the lips or face. On examination 24 hours later, there was little tenderness and the mucous membranes appeared normal. In no instance was it necessary to grind away the dentures in the early postoperative period.

In the control patients, postoperative swelling developed immediately in 90.3 per cent and was present in 100 per cent 24 hours later. Intraoral hematomas occurred in 93.5 per cent, pain and trismus in all, and pressure ulcers developed in 90.3 per cent during the first 24 hours.

Hyaluronidase is useful for preventing complications after extraction of anterior teeth when immediate dentures are to be inserted. The use of hyaluronidase with the local anesthetic is especially advantageous for extractions, filling and other restorative work in children, since more profound anesthesia is produced with a smaller volume of the drug, and postoperative edema and swelling are avoided.

Injection casting method for plastic dentures

Nils Strandberg, Stockholm. *Dent.Echo* 26:86-87 Feb. 1956

In the last decades, great progress has been made in the development of new casting methods for plastic materials utilized in the construction of artificial dentures. By introduction of the injection casting method, a new phase in this field has begun.

Previous attempts to use the injection technic in dental prosthetics were based on experience acquired earlier in industries when there was no knowledge of chemoplastics with liquid (monomer)-powder (polymer) base. Now, thermoplastics can be used in the construction of dentures of stability and uniformity by using the injection casting method. Great accuracy and conformity between model and denture are obtained without elevation of bite or other constructional errors by directly injecting the material (in the form of dry powder which already had been exposed to heat and pressure) into the closed flask. Accurately calculated pressure will provide a maximum of density to the material and an increased strength to the denture.

The introduction of specialized injection casting apparatus had been required by the expected utilization of additional plastic materials for the preparation of dentures. For a comparatively long time, nylon plastics, a flexible and unbreakable polyamide, proved to be unsatisfactory because it has a high water absorption and a low color stability and cannot be processed by the customary machines.

With the introduction of the new injection casting apparatus, however, all plastics whether on an acrylic or on a polyamide basis, can be used safely in dental prosthetics. The artificial teeth can be fastened with acrylic resin by both the thermoplastic or the chemoplastic method.

▼ Esthetics

Tooth shade matching and selection

Cyril B. Kanterman. *Bul.Alabama D.A.* 40:34 April 1956

Although the practice of dentistry is primarily a health service, many patients seek dental treatment for cosmetic reasons. A denture, bridge or jacket crown may be successful biologically and mechanically, but a failure for the patient if it does not meet his esthetic expectation. Not infrequently, the shade of artificial tooth is the patient's chief complaint against an otherwise acceptable prosthesis.

Tooth shade matching and selection is a deceptively simple technic complicated by a number of variables.

The matching and selection of shades should be made under the same conditions in which the completed prosthesis will be worn in the mouth. This is the secret of accurate shade matching. Shade matching is best done in natural daylight, preferably with the overhead light off. The quality of daylight should not be marred by nearby neon signs or other artificial illumination.

Selection is made with the patient standing directly in front of the dentist at "conversation distance" (about an arm's length). The shade guide tooth and the adjacent natural teeth, if any, are moistened for the proper reflection of high lights. The patient's lips should be retracted in a relaxed smile. Maximum retraction of the lips is not natural and may adversely affect a true shade matching.

As the patient is not always objective as to the proper shade, a third opinion may be helpful; a friend or relative of the patient should be present when shade selection is made.

The problem of convincing the patient that the tooth shade selected is best suited for him must be met. The myth of natural pearly white teeth is well-established in the minds of the laity; if the selection of shades were left entirely to patients, most would probably choose shades lighter than their own. The dentist knows that natural teeth are not normally pure white but, rather, contain varying degrees of gray or brown. The dentist should take the time to explain to his patient why a particular shade is indicated, allowing the patient to make a comparison for himself with the aid of a hand mirror. Under no circumstances, however, should the dentist force on his patient a tooth shade which the latter does not like.

Professional activities

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Education

The Dental Institute of the University of Münster, Germany

(Zur Geschichte der zahnärztlichen Universitäts-Klinik Münster)

P. Issel. *Deut.Zahnärztebl.* 9:757-759
Nov. 8, 1955

Dental education has undergone radical changes during the twentieth century. The improvement in quality and quantity of the training of dental students (compared with that of graduates about 50 years ago) is obvious. Most of the technics and methods of treatment have been refined and improved immensely, and new technics and methods have been developed. Superior equipment is available now—not only improved dental chairs, sterilizers, instruments and therapeutic and prosthetic materials, but high speed electric (and ultrasonic) drills, roentgenokymographs, roentgenometers, cephalometers, roentgenoscopes and electron microscopes, and many other inventions. Another recent development in dental education is the emphasis on specialization. Many courses are taught by specialists in their fields, and the students are motivated toward specialization after graduation.

More important than all the physical improvements is the gradual change occurring in the philosophy of dental education and the gradual acceptance by most educators that dentistry is not a collection of technics but a biologic science with its therapeutic procedures basically technical in nature.

In Germany, although hampered by the consequences of two world wars, dental science and dental education developed rapidly. The advances made in dental medicine have placed a tremendous load on German dental schools. It is almost impossible in crowded schedules to teach in crowded classes all that should be taught, and to provide the clinical experience necessary to prepare dental graduates properly for modern practice.

In 1905, the opening of the Anatomic-Physiologic Institute was the first step toward a creation of a Medical Faculty of the University of Münster. The Dental Institute was opened in 1908. In the first year 68 students attended classes, and in 1909 this number increased to 95. It was more difficult to attract patients, necessary for the clinical instruction, because in Mün-

Dental Institute and the new Prosthetic Department, University of Münster, Germany

ster at this time a dental institute and a dental clinic were new and strange. The free treatment of university students, school children and patients belonging to low income groups soon attracted sufficient patients for teaching purposes.

During World War I, the staff of the Dental Institute served under the supervision of the Army medical and dental corps. The Institute then was used not only as a clinic and hospital for injured soldiers but as a dental school for Army dentists.

After World War I, the number of enrolling dental students increased enormously; in 1919, 637 dental students attended courses. It was necessary to form double-shift classes in all fields of dentistry.

In 1920, the new orthodontic clinic was opened, and in 1922 a department of conservative dentistry.

In 1925, when the Medical Faculty obtained full status, the Dental Institute already was approved as an educational state school of the first rank. In 1926, dentistry obtained the same rights and privileges as any independent branch of medicine.

During World War II, several members of the staff were killed, and the buildings of the Dental Institute were totally destroyed by the Allied air force.

After being in several different temporary locations, the Institute again is located in a new modern building at Münster.

Dental and dental hygiene students: their characteristics, finances and practice plans. III. Total expenditures of dental students

American Dental Association, Council on Dental Education. *J.A.D.A.* 52:203-213 Feb. 1956

The Council on Dental Education of the American Dental Association and the Division of Dental Resources of the United States Public Health Service cooperated on this study.

The average amount spent by dental students in the United States to meet all school and living expenses during the 1953-54 academic year was $2,954. A fourth of all students spent more than $3,483, and a fourth spent less than $2,263.

Of the expenditures reported, nearly 40 per cent, or $1,119 per student, was devoted to meeting the various items of school expense—tuition and fees, textbooks, instruments, equipment and supplies, and fraternity or organization dues. The balance was consumed in meeting living costs while attending school. Average living costs for the school year, generally reported as a 10 month period, were $1,835.

The amount spent during the school year was closely related to marital status and type of living arrangements. Single students living at home spent an average of only $2,101 to meet both their school expenses for the year and "out-of-pocket" living expenses. Single students living away from home spent nearly $500 more—an average of $2,589—than did those living at home. Expenditures reported by married students averaged $3,602.

The expenditures varied from one class in school to another. Total expenditures were lowest in the freshman year with an average of $2,730. In the sophomore year the amount increased to $3,024; the amounts spent by juniors and seniors deviated but slightly from the latter figure.

Summarization of the estimates for each class in school indicates that the average student spent $11,814 to meet the four year cost of his education. Of this amount, $4,465 was consumed by the various school expense items, and $7,349 was used to meet living costs while attending dental school.

For the average married student, the total cost of four years in dental school was $14,452.

Students attending private schools spent nearly $800 (or about 7 per cent) more in the course of four years of school than did those attending public schools.

Regional differences were noted. Total expenditures for four years in school were lowest in the Northeast ($11,384). Totals in the other sections were as follows: North Central, $11,515; South, $12,042, and West, $13,321.

The cost of a dental education varies widely from student to student and from school to school. It bears only a limited relation to the basic school charges for tuition and related items.

Memorandum to the Committee of Enquiry into the shortage of recruits to the dental profession

Brit.D.J. 100:93-101 Feb. 7, 1956

The British Dental Association, in this memorandum, states that its current membership is 11,000, a large proportion of the 15,000 dentists whose names are entered in the Dentists Register.

The shortage of recruits to the dental profession is not a new problem. In 1943 the Teviot committee was established to consider measures to secure an adequate number of entrants to the dental profession.

For several years after the Second World War the dental schools were filled to capacity, as the intake figures for the following years show: 1946, 641 dental students recruited; 1947, 654; 1948, 647; 1949, 611; 1950, 606; 1951, 592; 1952, 537; 1953, 466, and 1954, 478.

Since 1952 the number of dentists who, because of age, had their names removed from the Dentists Register, has surpassed the number of dental students recruited. In 1951, 564 dentists retired; in 1952, 691; in 1953, 757, and in 1954, 581.

The practicing strength of the dental profession in England is well below what it should be. There is no prospect, at present, of deficiencies in numbers being made good. Indeed, not even sufficient students are being attracted to fill the places now available in the dental schools.

Among the reasons cited by the Association for the inadequate number of recruits to the dental profession are the following: public ignorance as to the nature of dentistry, the apparent limitation of scope in dental practice, and the apparent fact that in the eyes of the public the status of the dental profession is not as high as is justified by the work which dentists perform, the qualifications necessary before dentistry can be practiced, and the long period of training necessary.

Of 1,687 practitioners responding to a questionnaire sent by the Association, only 588 reported that they advised youth to take up dentistry as a career. This means that two thirds of the profession are not encouraging recruitment. Reasons given for discouraging recruitment included the following: the cost of training, the physical and mental strain of practice, inadequate remuneration in the National Health Service, and the insecurity of general dental practice in the National Health Service.

Among the recommendations of the Association are the following:

1. Dental health education should be continuous.

2. The prevalence of dental disease and the value of dentistry as an integral part of the Health Service should be stressed.

3. The attraction and value of dentistry as a career should be brought to the attention of the general public, teachers and school children.

4. Remuneration of dental practitioners in all spheres of employment should be generous rather than merely adequate.

5. General dental practitioners in the National Health Service should be given greater clinical freedom.

The U.S. Naval Dental School

U.S.Navy M.Newsletter 26:3-7 Dec. 23, 1955

The first in-service training of dental officers began in 1922 with the establishment of a Department of Dentistry at the U.S. Naval Hospital in Washington, D.C. Initially this school offered a course of three to four weeks, which included some military indoctrination and some professional instruction. From 1923 to 1936, many newly commissioned dental officers of the Navy attended this course. In February 1942 the Naval Dental School moved to Bethesda, Md., becoming a component command of the National Naval Medical Center.

The school presently conducts postgraduate and graduate instruction for Dental Corps officers in the field of dentistry and in military medical subjects; instructs dental technicians; participates in the preparation of training aids for naval dental personnel; prepares and administers correspondence training courses, and provides dental treatment and consultation for the National Naval Medical Center at Bethesda.

The Naval Dental School has the following five departments:

1. The Officer Education and Training Department conducts a ten month course for the in-service training of naval dental officers; develops residencies in oral surgery, prosthodontics, periodontics and oral pathology; offers courses in the various specialties of dentistry, and gives a 35 hour course in casualty treatment training to all officers and enlisted men.

2. The Clinical Services Department provides clinical support to the U.S. Navy Hospital and other commands of the National Naval Medical Center, and supports clinical research projects.

3. The Correspondence Training Courses Department plans, develops and administers courses for dental personnel. Sixteen courses are now available, and nearly 400 students are enrolled.

4. The Enlisted Education and Training Department offers three courses of instruction—a ten month course in dental equipment, maintenance and repair; a six month course for advanced general dental technicians, and a six month course for advanced prosthetic dental technicians.

5. The Training Aids Department coordinates the evaluation, preparation and production of training aids used to train dental personnel throughout the Navy.

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Dentistry around the world

The history of paedodontics in Canada

Edward R. Bilkey. *J.Canad.D.A.* 21:678-680 Dec. 1955

In 1925 a group of Canadian dentists organized a public health group, the Canadian Oral Hygiene Council, which instituted dental health education in every province in Canada. When the Council disbanded in 1947, its accomplishments were so widespread that dental health education was almost self-propelling by public demand, and was being financed by nine of the ten provinces. All the educational programs had emphasized early preventive and treatment care, beginning at two and a half to three years of age. Dentists who had been practicing for many years realized that their training in dentistry for children left much to be desired.

In 1947 the newly formed Division of Dental Services in the Federal Department of National Health and Welfare asked S. A. MacGregor (who had just been appointed head of the newly established pedodontic department of the Faculty of Dentistry, University of Toronto), to conduct postgraduate courses in this specialty across the Dominion. During 1948 and 1949 these refresher courses were held in nine of the ten provinces. Canadian dental schools rearranged their work schedules to establish departments devoted solely to the teaching of pedodontics.

The University of Montreal and the University of Toronto conduct short postgraduate courses yearly. The latter school in 1951 instituted a ten month graduate course, the completion of which entitles the graduate to certification as a pedodontist. (The course has been temporarily discontinued.)

The number of graduates enrolling in these courses is increasing.

Both the American Dental Association and the American Society of Dentistry for Children have been of great assistance.

In May 1951 the Canadian Society of Dentistry for Children (Ontario unit) was inaugurated. It is hoped that similar units will be formed in each province.

Dentistry for children is merely adult dentistry before the breakdown of the tissues. It affords dentists the opportunity to observe growth patterns, degenerative processes and the many changes which, if understood and dealt with early in life, may prevent replacement or reparative demands in adulthood.

The nation's state of dental health

Ricardo Y. Ladrido. *Philippines M.D.J.* 1:20-26 April 1955

The people of the Philippines did not begin to enjoy the benefits of modern dental science until half a century ago when the United States placed the islands under her benevolent tutelage.

Today there are 6,381 registered dentists in the Philippines. The nation's first dental college was

organized and incorporated in 1913 as the Philippine Dental College, and was authorized in March 1916 to confer the degree of Doctor of Dental Surgery. Today the nation has 18 dental schools and colleges with an enrollment of 2,663. Seven of the schools are in Manila and 11 are in the provinces. The largest dental school, the College of Dentistry of the University of the East, had an enrollment of 1,459 in 1951, compared with an enrollment that year of 581 at the College of Dentistry of New York University, the largest dental school in the United States. Although many of the Philippines' dental schools compare favorably with schools in the United States in matters of modern equipment, Philippine dental schools are substandard in the proportion of equipment to the number of students. Whereas in the United States only two students use a microscope at one time during a laboratory period, in a Philippine dental school the proportion is 15 students to a microscope.

A two year predental course was adopted in the Philippines in 1951 with passage of the Dental Act of the Philippines. Today the dental student must finish six years of training in college, consisting of two years of predental work and four years of the regular college course.

The medical and dental service now being provided by the public schools is a continuation of the prewar dental and nursing service conducted in the schools by the Red Cross which organized the service in 1922 and discontinued it during the Japanese occupation. In 1953 a five year survey of common ailments among school children showed that diseases of the mouth, teeth and gingiva constituted the greatest number of ailments among Philippine school children.

In the armed forces 96 dental officers are charged with the dental care of 59,000 officers and enlisted men. In 1954 Congress approved what is now Republic Act 1128, creating the dental service as a separate and independent service in the armed forces.

The government also provides dental service for the general public in the form of charity clinics. Established in 1939, this service constitutes practically the only dental assistance to the people at large in the various congressional districts. Today the government employs one dentist for each of the congressional districts, or 162 dentists; 24 dentists for the different health centers in Manila; 24 for the dispensary in the Bureau of Health; 264 for the Bureau of Public Schools, and 96 for the armed forces, or a total of 570 dentists. In addition there are 80 dentists employed by private colleges, private firms and government offices.

The nation needs graduate schools for research and for advanced studies in dentistry. The number of dentists engaged in rural health work should be increased, and such dentists should be provided with dental assistants, as has been done for the dentists in the armed services and schools.

This report was delivered before the Philippine House of Representatives in February 1955 by the author, a dentist, a Congressman and a past president of the Philippine Dental Association.

Present status of shika-rikogaku in Japan

Shinkyo Iwao. *Asia D.Congress* 27-29 1955

Shika-rikogaku, meaning literally chemical, physical and technical science in industry, is the name given to these basic sciences of dental technic by Masaru Nagao about 25 years ago. *Shika-rikogaku* is the branch of dentistry concerned with the study of the quality and efficiency of dental materials and appliances, and the technics of applying them to dental practice.

Students are first given a short course in dental technic. The experience gained through laboratory training is then arranged and integrated through lectures, discussions and studies. Further knowledge is acquired by visiting factories, by laboratory training in testing materials and through supplementary lectures. Between 100 and 200 hours of instruction are devoted to the subject.

The manufacture of dental materials and appliances began in Japan about 30 to 40 years ago. During the chaotic postwar years production was retarded, but today, with few exceptions, the supply of home manufactured products is sufficient for Japanese needs, with a fair margin left for export.

About 50 companies produce dental materials, and about 80 companies manufacture dental appliances. Each factory conducts research to im-

prove its products. Many reports and publications have come from the laboratories attached to large companies. Scientific reports also have been issued from the following: Research Institute of Dental Materials, Tokyo Medical and Dental University; National Tokyo Hygienic Laboratory, and the research laboratories of *shika-rikogaku* of the Japanese dental schools.

To integrate the work of laboratories throughout the country, the Japan Research Society of Dental Materials and Appliances was organized four years ago. This society publishes studies in the field and holds periodic exhibits of materials and appliances. Since 1945 about 1,000 papers in this field have been published.

In spite of the great advances in science throughout the world, the educational level of students entering dental schools in the past 15 years appears even lower than the prewar level. Since the war, dental education has been elevated to the American standard. Now that Japan has recovered in large measure from the damage wrought by war, the general educational level of students entering dental schools no doubt will be raised.

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Hospital dental service

Kosair Crippled Children Hospital

Pat H. Lyddan. *J.Kentucky D.A.* 8:32-33 Jan. 1956

In 1946 the School of Dentistry of the University of Louisville, Ky., established a dental service for patients at the Kosair Crippled Children Hospital. Kosair is an orthopedic hospital and most of the patients are there for treatment lasting many months. In January 1947 three dental students were assigned to Kosair each Friday, to work under the supervision of the instructor. Today every child at Kosair receives adequate dental care. A new dental clinic was built by the hospital last year. The new clinic has modern equipment, thanks to several donations and the generosity of the Louisville District Dental Auxiliary. Patients who are physically able are treated in the regular dental chair. Patients who cannot use the chair are treated on a litter or in bed. In extreme instances dental treatment is given in the wards with mobile equipment.

Hospital rounds are made by the students each clinic day. All patients admitted since the last visit are examined and classified according to their dental needs. Close cooperation with the medical staff is maintained.

In 1954 dental students performed the following work: 432 restorations, 76 extractions, 320 examinations, 115 treatment fillings, 9 prophylaxes and numerous roentgenograms.

The assignment to Kosair Hospital gives the student valuable education. He acquires additional experience in treating children, particularly handicapped children. He becomes familiar with hospital routine and learns to treat patients on litters or in bed.

The dental service of Freedmen's Hospital

John A. Turner. *Bul.Nat.D.A.* 14:43-45 Jan. 1956

The Freedmen's Hospital, of Washington, D.C., is a 533-bed hospital with dental facilities consisting of five chairs, four units and two x-ray machines. The main operating room is utilized for major oral surgical operations. In 1954, 3,059 patients were treated in the dental service department. There were 217 operations, exclusive of exodontia, which included fractures of the jaw, benign tumors, cysts, plastic operations, incision and drainage, osteomyelitis, biopsies and removal of tori.

The personnel of the hospital includes 16 dentists of whom ten are attending dentists and six are consultants. A dental hygienist and a nurse anesthetist are attached to the dental service.

The hospital library is well supplied with dental periodicals and books. The oral surgery department utilizes the services of the pathology department and of the laboratory. Clinical pathological conferences are attended by dental service personnel.

Complete-mouth roentgenograms are made for approximately 50 per cent of the patients. There is an anesthesiology department and the services of a certified anesthetist are utilized.

The hospital's dental and oral surgery service was initiated in 1924. The clinic originally occupied two rooms on the main operating floor, but subsequent expansion has resulted in a decentralization of the facilities. Today there are three clinics: (1) an outpatient clinic consisting of three chairs, roentgen ray apparatus and dark room, office, waiting area and rest rooms; (2) an inpatient and emergency clinic, on the ground floor of the main building, and (3) a clinic for patients with respiratory diseases, on the first floor of the annex.

The dental service has two interns who are integrated into the resident staff and have all privileges. A residency program will be introduced soon. A full-time dental hygienist is responsible for the functioning of the clinics. The nurse-anesthetist of the oral surgery department of the College of Dentistry is available for anesthesia service in the clinic and operating room. Specialists in the various fields of dentistry serve as consultants. The attending and consultant staff attend the regular hospital staff meetings.

The hospital is fully approved by the Council on Hospital Dental Service of the American Dental Association. The 12-month internship program in oral surgery has been approved by the Association's Council on Dental Education.

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Miscellaneous

The fight against drug addiction
(Süchte und ihre Bekämpfung)

Kurt Kolle. *München.med.Wschr.* 98:8-10 Jan. 6, 1956

Drug addiction can be defined as an overpowering urge for narcotics, or as an intoxication by drugs possessing either narcotic or intoxicating properties. Persons who are habituated to the use of such drugs become enslaved to them and a progressive mental and moral deterioration takes place.

Drug addiction is not limited to any special group of society; the rich and the poor, the strong and the weak, all are represented. No nationality, no race, no color or no class is exempt. Men, however, outnumber women in a proportion of about four to one.

Narcotics are sometimes prescribed by physicians or dentists inadvisedly and contrary to pharmacologic facts or professional ethics. Recent studies in addictology, however, reveal that both professions bear little blame for the circulation of drugs, and that drug addiction in their ranks, previously very high, has decreased.

The fight against drug addiction can only succeed when (1) physicians and dentists are observing correctly the narcotic laws of their countries (according to which cocaine, morphine, codeine, meperidine hydrochloride, methadone hydrochloride and their derivatives are classed as narcotics); (2) pharmacies and drugstores are supervised by the public health authorities, and (3) the pharmaceutical industry becomes aware of the danger of increasing drug addiction.

In the true meaning of the term, addiction is not limited to drugs. Every form of human activity can develop to the point of mania and addiction. Even work, sports and games, collecting of things, singing and dancing, radio and television, can deteriorate into an addiction. Even though Kant, in his philosophic evaluation, did exclude love from passions which can produce addiction, von Gebsattel's studies reveal that a parallel exists between drug addiction and sexual abnormality.

The cause of every form of addiction is a real or imagined emptiness in the patient's daily existence. This emptiness is, at least temporarily, filled by a pseudo realization of desires and dreams while under the narcotic. Addiction, therefore, is not only a pharmaceutical but a sociologic, biologic and anthropologic problem.

Who is free from greediness, craving for power or vindictiveness? Such forms of addiction, however, have other causes than the indomitable, unquenchable passion for drugs. In drug addicts, the center of individual characteristics is transposed. Such a phenomenon can be caused by processes and complexes similar to cleavage or fissuration of the mental functions occurring in schizophrenia.

Fortunately, the number of persons who use drugs habitually is not high and is decreasing

steadily. The majority of drug addicts can be treated and cured by psychotherapy.

Primary treatment consists of withdrawal of all drugs possessing narcotic properties. The prospect of cure depends on the ability of the patient to regain his natural individuality, on his will power to resist the urge to take narcotics again, and on the establishment of confidence and trust between him and his environment. In some instances of severe conditions, hyoscine hydrobromide or chlorpromazine hydrochloride therapy (not always successful) has been recommended.

The prognosis, however, still is dark. Cured drug addicts are rare. The mortality in drug addicts is comparatively high because of frequently occurring suicides.

The challenge to the private practice of dentistry

Irvin Leland Hunt. *Bul.Hudson Co.D.Soc.* 25:18-20, 26-29 Jan. 1956

Dentistry is a profession characterized by education beyond the usual level, with the primary duty of service to society, and possessing the privilege of self-government. These characteristics constitute both a privilege and obligation, subject to the will of society, and create challenging political problems.

Among the factors which challenge the continuance of the private practice of dentistry are the rising cost of dental service and the increasing demand for it.

Although dentistry benefits from the technological advances in industry, and the advancement of knowledge in related fields, what dentistry receives technologically is largely a by-product of industry. Although high-speed tools have been developed that conserve the labor of the dentist, most dental technics have tended to become increasingly involved and exacting, requiring the increased preparation of the student and practitioner for their use.

Among the factors which have been accelerating the demand for dental service faster than can be met by the dental manpower in many sections of the country are the following: the rising standard of living; education in dental health; the advertising of dental products, and the exposure of millions of youths to dentistry while serving in the Armed Forces.

The situation is compounded by a maldistribution of dentists throughout the nation. Dental manpower has tended to concentrate in areas with the greatest buying power.

In 1953 only 40 per cent of the population in the nation received any dental care. There is the prospect of having ultimately to provide for the remaining 60 per cent. This demands an increase in the recruitment of dental students, and in the facilities for their education. Ways must be found to reduce the cost of dental education or to subsidize the student. Established dental schools must have adequate funds for improvement and expansion, and new schools must be built. Such money can come from industry or from government. It seems inevitable that the money will come from the government.

The maldistribution of dentists may be a greater problem than the shortage of dentists. Dentists have been recruited largely from metropolitan and industrial areas. To the dental graduate conditioned to life in the city, the prospect of living in rural areas is unattractive. But the demands and needs of people in rural, remote and backward areas must be met.

The basis for the principle of the private practice of dentistry is the right of the patient to choose his own dentist, and the resulting challenge to the dentist that his professional success will be determined by the quality of service he renders.

What dentists mean by "adequate" service may have to be re-evaluated. Possibilities must be examined of simplifying dental technics and methods of conducting private practice, of achieving greater efficiency in serving patients, of obtaining new materials and methods, and of professionally assisting colleagues willing to practice in the more remote areas.

The profession must be concerned with more than fillings, bridges and dentures. Dentists must concern themselves with politics, sociology, psychology and economics. The challenge to the private practice of dentistry will be met by this generation of dentists.

Orthodontics and pedodontics

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Growth and development

Some indications of the early causes of malocclusion

R. R. McIntyre. *J.Canad.D.A.* 22:69-81 Feb. 1956

In the past 25 years, progress in orthodontics has been as great or greater than the progress achieved in local anesthetics, prosthetics and casting technics. Considerable knowledge has been gained of the functioning of the various glands, particularly those concerned with growth and development; of favorable and unfavorable habits, and of diet, metallurgy and cephalometrics.

The human skull at birth has 24 dental follicles (20 deciduous teeth and four first permanent molars). The crowns of the deciduous teeth have attained their full mesiodistal width and are in normal position for eruption. Horizontal growth takes place from the twenty-first day to the seventh month, when the lower deciduous incisors erupt.

At birth the face forms one ninth of the head, whereas at maturity it is one third of the head. This growth of the face is necessary to accommodate the teeth.

The nursing infant carries forward his mandible so that the lower gum pads are directly below the upper pads, in order that milk may be sucked into the mouth. Children who are bottle fed at an early age are handicapped, because the

Figure 1 The skull at birth has 24 dental follicles—20 deciduous teeth and four first permanent molars

Figure 2 At birth the face forms one ninth of the head; at maturity, one third of the head

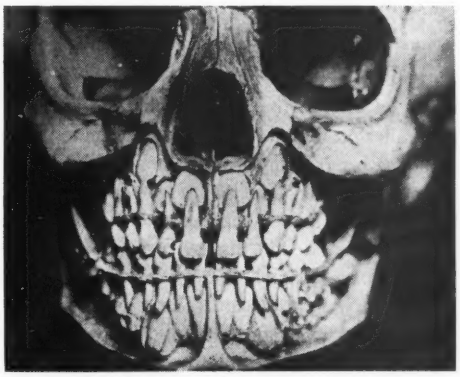


Figure 3 Note the spacing of the upper deciduous teeth in preparation for the eruption of the permanent central incisors in this skull of a five year old child

bottle and nipple frequently are held at an angle and prevent the mandible from moving forward.

Primitive man ate a type of food that would wear or grind the deciduous teeth adequately and favorably. Because today's diet does not accomplish this, the dentist must grind the teeth of patients artificially where indicated. The high cusps of the deciduous cuspids frequently require such grinding.

The deciduous dentition should be adjusted because it is in the early years that certain phases of malocclusion are initiated. Children readily adopt a "bite of accommodation." This may be altered by judicious artificial grinding as is done in denture service. The result is increased masticating efficiency and comfort, a favorable muscle development and a normal growth pattern.

Some factors tend to initiate in the deciduous dentition a defective alignment that later is carried over into the permanent dentition. Such factors include the following: abnormally high deciduous cuspids; a protrusive bite produced by deciduous cuspid interference; supernumerary teeth interfering with the normal development of the permanent teeth; ectopic (abnormal) eruption of teeth, and faulty tongue and lip habits, including tongue thrusting and thumbsucking.

The early and continued use of roentgenology, the closed mouth examination of children so that the relationship of the distal borders of the second deciduous molars may be noted, and the occlusal adjustment of the deciduous dentition are advocated.

Dental conditions among the Polynesians of Pukapuka (Danger Island)

G. N. Davies. *J.D.Res.* 35:115-131 Feb. 1956

Virtually the entire population (648) of Pukapuka, an atoll in the South Pacific Ocean about 390 miles northeast of Samoa, is descended from some 20 survivors of a hurricane and tidal wave which swept the atoll about 350 years ago. In 1951 a dental survey was made to determine the prevalence of dental disease and to investigate the various factors which might contribute to the etiology of dental disease. The survey was part of a medical investigation sponsored by the New Zealand Medical Research Council.

A definite malocclusion was found in 168 (35.6 per cent) of 472 natives examined. The proportion affected was highest among youths and adults with permanent dentitions and lowest among young children with deciduous dentitions.

Of the 168 with malocclusion, 93 were classified as having Class I malocclusion (in which the body of the mandible and the mandibular teeth were in correct mesiodistal relationship to skull anatomy), 18 as having Class II (in which the body of the mandible and the mandibular teeth were in distal relationship to skull anatomy), and 57 as having Class III (in which the body of the mandible and the mandibular teeth were in mesial relationship to skull anatomy).

The incidence of malocclusion (all types) and of Class I and Class II malocclusion are lower in Pukapuka than among white children in Wisconsin, but the incidence of Class III malocclusion is higher in Pukapuka than in Wisconsin.

The fact that 35.6 per cent of the natives had a definite malocclusion cannot be explained on a functional basis alone. The Pukapukans live on a diet of hard, bulky and fibrous substances said to be essential to the prevention of malocclusion. In Pukapuka, 45 per cent of adult teeth showed signs of pronounced attrition, and no correlation was found between third molar occlusion and attrition. If function is the main determining factor in jaw development, as Klatsky asserts, the Pukapukans should show little evidence of malocclusion. The reverse is true.

Although the evidence concerning familial tendencies is inconclusive with regard to the transmission of certain types of malocclusions, it does suggest an extensive operation of genetic influences. In all instances in which a Class III malocclusion occurred in a child, it was also apparent in either a parent or a grandparent. On the other hand, when both parents had a normal occlusion 93.5 per cent of the children had a normal occlusion and the remaining 6.5 per cent had a Class I malocclusion.

These observations do not negate the importance of function but suggest that adequate function is important in the development of the maxilla and mandible only insofar as it enables the organism to reach its full capacity for growth. The growth potential of the jaws and dentofacial complex generally is probably an inherited character,

but the precise mechanism of its inheritance is as yet unknown.

The occurrence of an occlusal anomaly may be the result of natural selection. The original mutations may have occurred many centuries ago and, since the community is small and isolated, one should expect an enhanced survival of particular genes or gene combinations which govern the degree and the rate of development of certain somatic entities.

▼ Pedodontics

Some problems relating pediatric and dental practice

T. C. Crewe. *School D.Service Gaz., New Zealand* 15:53-54 Sept. 1955

Pediatric practice and pedodontics share the ultimate aim of improving the health of the children of the community. The child's best interests are served if operators in both fields cooperate.

The teeth begin to develop in the sixth week of embryonic life, and grow and develop from that time until the early twenties. For the whole of this period the body requires an adequate supply of building materials to produce sound, well-developed teeth with normal supporting tissues. Since some dental tissues are more highly calcified than any other body tissues, they require, in addition to ordinary tissue building material, calcium, phosphorus and vitamins A and D.

The fetus acts as a parasite and will obtain the necessary tissue-building factors at the expense of the mother's own tissues if there is a shortage of ingested materials. If insufficient calcium is supplied in the mother's diet, the fetus will draw its supply from her bones, but not from her teeth. The popular idea that calcium is withdrawn from the teeth during pregnancy is fallacious.

Teething lasts for a period of 18 to 24 months, beginning about the age of 6 months.

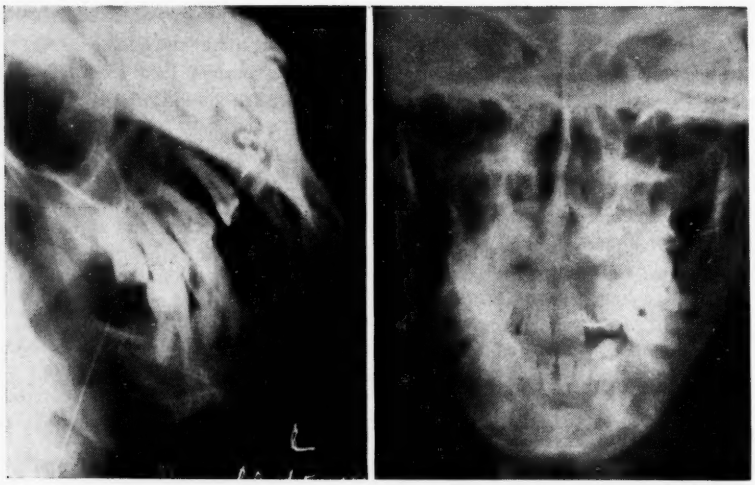
Some common local disorders associated with teething are the following:

1. Early eruption: not usually significant, except as a cause of irritation of the child's or mother's tissues.
2. Late eruption: not significant. Each child follows his own, rather than an average, growth pattern.
3. Pain: most likely occurs some time before the tooth appears in the mouth. A clean teething ring or clothes peg is better than a free choice of unsuitable or undesirable objects to bite.
4. Stomatitis: poor hygiene may be an underlying cause.

Treatment involves general treatment of the patient as a whole—improvement of diet, correction of bowel upsets, rest and sleep, sunshine, fresh air, and local treatment of the inflamed oral tissues.

General disorders associated with teething include the following:

1. Increased salivation: may cause drooling, eustachian block and a bubbly cough caused by inhalation. Regular changes of clothes, avoidance of draughts and continual drying of the face may help prevent complications.
2. Fever: cause or effect of eruption of a tooth. Treatment is general nursing care.
3. Gastrointestinal upsets: often caused by dietary changes, acute ear, nose and throat infections, or food poisoning.
4. Failure to gain weight: may result from gastrointestinal upsets or sore mouth.
5. Anorexia: may be caused by painful mouth or a general loss of appetite.
6. Irritability and sleeplessness: may be caused by rickets, which must be checked first and eliminated.
7. Convulsions: probably resulting from some neuropathic or general condition. The patient should be kept warm in bed.



Lateral oblique and posteroanterior views of lower left side of the mandible help to locate the needle

Oral surgery

▼

Surgical technics

Technic for recovery of broken needle in soft tissue

F. J. Acquavella. *New York D. J.* 21:333-335 Aug.-Sept. 1955

A 26 year old woman was referred for the recovery of a needle which had been broken in the tissues during an inferior alveolar injection for the extraction of a lower left molar. The needle had been broken about one hour previous to the time the patient was seen. The site of insertion was normal. The dentist had made no attempt at recovery. Soft tissues in the region of injection were not edematous. Lateral oblique and posteroanterior roentgenograms were taken of the lower part of the left side of the mandible; the needle, approximately 1⅛ inches long, was demonstrated in a position medial to the ascending ramus of the mandible, almost at the level of the lingula. In the lateral view, the needle point was seen extending beyond the posterior border of the mandible and pointing downward.

Meperidine hydrochloride, 100 mg., was administered intramascularly 45 minutes prior to the operation. The mucous membrane in the retromolar area was dried and the area painted with tincture of thimerosal 1:1,000. An inferior alveolar lingual nerve block injection was given with 2 per cent lidocaine with epinephrine 1:100,000. Additional solution was infiltrated medial to the needle. An incision was made from the distolingual aspect of the left second molar posteriorly and superiorly on the medial aspect of the ascending ramus to a point presumed to be 2 or 3 mm. above the embedded needle. The fibers of the buccinator muscle, near its attachment to the pterygomandibular raphe, were separated. The needle was encountered and removed in the same path as its insertion.

It is suggested that, since most needles break at the hub, it is unwise to insert as far as the hub. A 24 or 25 gauge needle is probably safer to use than one of finer caliber. A thumb forceps or hemostat should be available to grasp the broken end if it is not buried in soft tissue. If the needle has disappeared, a black silk suture should be fixed to the point of entry, to serve as a guide for any later attempt at recovery.

The contribution of the dentist to the cancer team

Cancer Bul. 8:97-99 Sept.-Oct. 1955

The maintenance of oral hygiene is only one important part of the dentist's contribution to the cancer team, before, during and after treatment. Radiation therapy creates problems in which the dentist can be of particular help; examples include the construction of lead shields to limit the field of irradiation; creating a mold to maintain radium needles in exact position, and construction of dentures or prosthetic appliances after radiation therapy or surgical resection.

Pyott has outlined four basic rules for the production of satisfactory restorative results in defects of the face or mouth:

1. If the ends of mandibular fragments are to be held apart mechanically, approximately the same distance should be maintained after operation as before.
2. Normal occlusal relation of the remaining teeth should be maintained by dentures.
3. If there has been resection of the upper jaw and bone and soft tissues have been removed, obturators, stints and splints must be used for protection of tissue grafts and open areas during the healing process.
4. A permanent prosthesis should maintain normal facial contours and function of the jaws.

The dentist has an opportunity and a responsibility to detect cancer, and he contributes to the care and rehabilitation of the patient who undergoes extensive irradiation or surgical therapy.

Malignant tumors of the superior maxilla

M. G. Lynch. *South.M.J.* 48:569-574 June 1955

Because of the varied embryologic elements involved, tumors of the maxilla may be any of a wide range of benign and malignant lesions. Giant cell tumors as well as adamantinomas can undergo malignant change and should therefore be considered malignant.

Of the malignant tumors by far the majority are carcinomas of the squamous cell variety or adenocarcinomas, making up some 60 to 70 per cent of malignant lesions in this region. Sarcomas are occasionally encountered. Because of the size of the cavity of the maxillary sinus, most malignant as well as benign tumors are usually far advanced before their presence is discovered.

The usual symptoms are pain, swelling over the involved sinus in the facial, alveolar or orbital regions, nasal obstruction, nasal discharge which may be purulent, mucopurulent or bloody, epistaxis, and lacrimation. Pain usually occurs in the face and upper teeth, with occasional paresthesia, which may become puzzling. Metastatic extension usually occurs first in the submaxillary and carotid nodes which are surgically accessible, and in the retropharyngeal nodes by extension in the orbital region and ethmoid bone.

The diagnosis of malignant tumor of the maxilla is based on the symptoms, roentgenographic observations, and biopsy, which is the final arbiter and provides the only accurate basis of treatment. Investigations should be made if a patient has pain in this region out of proportion to the physical findings, especially if the pain involves the teeth and persists after therapy. Likewise, biopsy should be obtained if a tooth socket fails to heal.

Once the type and degree of malignancy are established, the best method or combination of methods of treatment must be determined.

After a positive result of the biopsy, which must be obtained in all instances, the maxilla should be resected. The incision which provides the best cosmetic result, as well as an adequate operative field, is the modified Moore type.

The entire maxilla including the palate and alveolus is removed. The nasal bone or lateral portion, at least, with the frontal process of the maxilla should be removed, as this gives wide access to the ethmoid sinuses and, if necessary, to the frontal sinus. A saw or preferably a sharp chisel is used to cut through the zygomatic process and lateral wall of the orbital region. The alveolus is divided near the midline by means of a sharp chisel. Bleeding is controlled by hot packs and pressure. Actively bleeding tissues are ligated. The entire cavity is then packed not too tightly with petroleum jelly gauze with tincture of benzoin. The author does not recommend skin-grafting this cavity, as suggested by some, because a graft would cover the region of examination at a later date and might conceal evidence of early recurrence.

The petroleum jelly and tincture of benzoin packs are usually removed after four or five days. As soon as all packing has been removed, a mold of dental compound is inserted into the defect. This prevents contraction of the skin and soft tissues until the cavity has healed and a proper prosthesis can be made. The dental mold is kept in place at all times, being removed only to irrigate the cavity and during the time roentgenotherapy is actually being given. Irradiation is begun as soon as the cutaneous incision has healed thoroughly and sutures have been removed. These patients should be given a full course of roentgenotherapy depending on the type, grade and sensitivity of the tumor. Usually about one month to six weeks is required for complete healing of the cavity after completion of the course of irradiation. At this time the patient may be fitted with a permanent prosthesis.

In inoperable tumors radiation with implantation of radium needles and minimal surgical excision of excessive neoplastic tissue offer at times surprising palliation.

The wide range of operability created by the availability of antibiotics added to the newer technics in anesthetization and the advance in radiation therapy should stimulate renewed interest in the management of these tumors.

Examination of speech function after cleft palate operations
(Die Prüfung der Sprechfunktion bei Gaumenspaltenoperationen)

F. Doubek. *Fortschr.Kief.Ges.Chir.* 1:104-111, 1955

The most essential criterion for success or failure in a cleft palate operation is the degree to which reconstruction of the speech function has been obtained. The evaluation of the results achieved in such surgical procedures, however, usually depends on subjective judgment solely. Therefore it will be necessary to find a more objective, comparative and internationally feasible method for the determination of success or failure in cleft palate operations. The fact that at present surgical intervention is the main technic utilized to correct the condition seems to demonstrate that the problem of speech function still is misunderstood. The solution of such a problem does not rest solely in the surgical procedure. In many instances, even though oral or plastic surgery has been successful, a complicated reconstruction of speech function by other means is necessary.

The "cleft palate speech" is characterized by a reverberating covibration in the suprapalatal region (rhinolalia) which changes the tonality and frequency of most uttered sounds, dislocates the ascending tones by alteration in position of the epiglottis, and forms a complicated system of laryngeal and pharyngeal compensatory phonetic notations. In such instances, the correction can be achieved only by speech therapy which combines the efforts of orthodontists, prosthetists and phoniatricians.

The oral or plastic surgeon frequently has not only to correct the esthetic appearance of cleft palate patients; he also has to eliminate the nasality remaining after most cleft palate operations. The elimination or correction of other pathologic speech symptoms, however, belongs in the field of associated and specialized branches of medicine and dentistry.

The anatomic prerequisites of a functionally correct closure of the nasal cavity depend not on the length of the velum but on the movability of the complete muscular apparatus of the naso-oral sphincter and on an adequate musculature of the newly created palate.

Oral and plastic surgeons, interested in the reconstruction of the speech function after cleft palate operations, suggested a similar cooperation between phoniatricians and surgeons as has already been established successfully between phoniatricians and otorhinolaryngologists.

At the Trauner Clinic in Graz, Austria, objective investigations of speech function after cleft palate operation have been made for many years. The observations made can serve as guides in and after cleft palate surgery. The results of these studies, in which new manometric methods (rhinoaerometer) were used, indicate that previously performed traumatic surgery often produced not only considerable facial deformity but functional speech inadequacy.

Recent progress in electroacoustic research makes it possible to supplement the measures of the aerodynamic nasality with measurements of

the oral and nasal sound pressure, and to register the individual sound phenomenon instead of its mediator.

The sound pressure recorder (isochronic recording device) registers oral and nasal sound pressure by a double microphone and lists all different sound values separately. The main advantages of this instrument consist in:

1. Evaluation of speech by a registration of the air pressure and sound pressure.
2. Measurement of the oral and nasal sound pressure simultaneously recorded by the double microphone.
3. Possibility of an immediate correlation of all obtained sound values.
4. Elimination of erroneous sources usually caused by alternating sound intensities.
5. Evaluation of complete words and sentences instead of that of isolated sounds.

The apparatus can easily be operated by a moderately skilled person.

This method facilitates a comparison of results obtained by one institute with those of other institutes.

The sound pressure recorder, in combination with roentgenology and electrodiagnosis, achieves the correct recording of objective and comparable values which can serve not only as a criterion for cleft palate operations but as an aid in expediting the diagnosis and evaluating the prognosis, and finally as a control apparatus during speech therapy.

Lengthening the mandible

Kurt H. Thoma, Bertram H. Sawyer and Edward J. Wasilewski. *D.Radiog.& Photog.* 28:64-67 Oct. 1955

In the case reported, bilateral fractures of the mandible were utilized to lengthen the mandible by the insertion of grafts. The advancement was accomplished without severing the inferior alveolar nerve and vessels by placing large chip grafts into the space, which was maintained by means of a bone plate.

The patient, a 39 year old Navy veteran, was brought to the hospital in an unconscious state. His condition was diagnosed as bilateral fracture of the mandible and brain injury. Roentgenograms showed bilateral fractures through the midportion of the horizontal ramus, just behind and involving the sockets of the bicuspid on each side. The dental examination disclosed a pronounced Class II malocclusion, and a pre-existing deformity of the mandible, a "recession of the chin," which had been caused by a motorcycle accident.

Open reduction was planned and executed, with advancement of the anterior part of the mandible. This was done by means of rib grafts and fixation with stainless steel bone plates to maintain the position of the fragments until consolidation of the bone had occurred.

An incision two inches long was made 2 cm. below the lower border of the mandible. The periosteum was incised at the lower border and the fracture site was exposed. The fragments were freed from the attached tissues both on the inner and outer aspects of the jaw. The bone fragments were grasped by bone forceps and distracted. A bone plate was applied to the external surface, as close to the inferior border as possible. Holes were drilled with a no. 6 round bur, and the plate was securely anchored with two screws in each fragment. Pieces of rib were wedged into the space between the fragments on each side of the nerve and vessels extending through the gap. Additional bone was positioned around the bone plate. The periosteum was drawn over the bone and sutured with no. 00 catgut. The deep fascias were approximated and sutured and the skin incision closed.

A rubber dam drain was inserted between the sutures to take care of oozing, after which a dressing was applied. The other side was prepared and operated on in the same way. The mandible was immobilized by means of intermaxillary stainless steel wires placed around the corresponding lugs on upper and lower arch wires previously attached. In the new position of the jaw, the retrusive Class II malocclusion had been corrected.

The patient made an uneventful recovery. Ten weeks after the operation, the intermaxillary wires and splints were removed. Because the incisions had been well placed below the mandible they were not noticeable, and the appearance of the patient was greatly improved. The operation is illustrated with 13 photographs and roentgenograms.

Myxoma of the mandible

A. C. Brewer and J. H. Johnston. *Brit.J.Surg.* 38:325-326 Nov. 1955

Central myxoma of the jaw is a rare tumor. Thoma and Goldman were able to collect a series of 11 cases. In all except one of these, a tooth was missing or embedded. The reported case is of the rare type where no dental abnormality is associated.

A 24 year old girl complained of a painful swelling in the left side of the lower jaw which had been present for three months and was slowly increasing in size. Examination revealed a smooth, hard, ovoid enlargement of the left body of the mandible over which the soft tissues moved freely. A roentgenogram showed a multilocular cystic tumor which was considered to be either an osteoclastoma or an adamantinoma.

An intraoral operation for curettement of the soft mucoid material was performed, but eight months later the tumor was found to have recurred in the original site. Histologic examination of the specimen showed replacement of the marrow by a relatively acellular myxoma.

Resection of the mandible was deemed necessary. Dental clearance of the left side of the mandible was carried out. The gingival tissues and alveolar ridge were given a period of six weeks to heal. Cap splints were fitted to the teeth of the maxilla and to the remaining mandibular teeth. It was decided to achieve fixation by an external bar fitted to these caps, the proximal fragments being controlled by pin fixation.

At a second operation the pins were placed in position in the proximal fragment, and the external carotid artery was ligatured in continuity through an incision at the anterior border of the sternocleidomastoid muscle. Through an external skin incision the mandible was resected from the right incisor teeth to the junction of the body and ramus. This was carried out as an extraoral procedure, the mucous membrane of the mouth not being opened. A graft was then taken from the subcutaneous surface of the left tibia and fitted as an inlay. The wound was closed without drainage, and splints were applied.

Eight weeks after the operation the extraoral bar and pins were removed, and five weeks later, when the roentgenogram showed a sound union of the graft, the cap splints were removed. Dentures subsequently were fitted.

The patient shows no recurrence of her tumor and complains of no disability. The cosmetic effect is excellent.

Palatoplasties

Kerwin M. Marcks, Allan E. Trevaskis and Milton Tuerk. *Plast.& Reconstr.Surg.* 16:352-361 Nov. 1955

Complete surgical and anatomic success has been obtained with palatoplasties in 100 patients, without morbidity or mortality, at the Allentown Cleft Palate Clinic in Allentown, Pa. The technic described herein, conceived by T. Pomfret Kilner, of Oxford University, England, is employed extensively.

Patients with cleft palate should have the benefit of surgical closure. Sufficient evidence has been presented in the past to show that good restoration of the palate has been accomplished satisfactorily by good surgery. Contraindications include insufficient material, a poor surgical risk, or older age. It is believed that eventually there will appear a definite method of determining whether the patient should have his palate restored by prosthesis for complete rehabilitation, especially from a speech standpoint.

Restoration of the palate is not sufficient to rehabilitate completely the person with cleft palate. For a surgeon to state dogmatically that he can handle the entire situation himself is to deny the patient an opportunity to benefit from the services of other specialists. The greatest advance in cleft palate rehabilitation was the development of group organizations embracing plastic surgeons, general dental practitioners, orthodontists, prosthodontists, psychologists, speech therapists, pediatricians, otolaryngologists and others.

It would be desirable to establish what is normal speech. Speech results are being categorized without any scientific basis. A survey of the clinic's patients is being made; speech recordings are being analyzed not only by speech therapists but by a group of employers, lawyers and students.

There is a need in cleft palate rehabilitation for

the collection of objective data to determine the intercorrelation of the patient's problems, and to evaluate the effectiveness of rehabilitative procedures in the fields of medicine, surgery, dentistry, speech and psychology. In the long run the care of the patient with cleft palate will be advanced most by a program which involves the systematic collection of objective data and their evaluation by persons who are scientifically oriented.

▼ Plantation

Metallic implant in a totally edentulous patient

(Implantado metálico num desdentado total)

Fernandes Cruz, G. Lacombe and Y. Deschamps.

J.estomat., Lisbon 2:5-8 Aug.-Sept. 1955

The history of the development of metallic implants in the mandibular bone to support prostheses worn by edentulous patients is reviewed. The following case report is representative.

Before the operation, a thorough general examination of the patient was made and intraoral and extraoral roentgenograms taken of the jaws. The mandibular bone was found to be greatly resorbed but otherwise normal. The mucosa of the mouth was also normal. Prior to the operation, upper and lower alginate impressions were taken which were used in the construction of individual trays, on which the definitive molds were made in plaster. From a model obtained from these molds, a layer of plaster was removed equal in thickness to that of the soft tissues covering the bone. From this model, individual trays were made with which impressions were taken directly from the mandibular bone when it was exposed during the operation. The other model was used in studying the articulation and the mounting of the teeth to determine the exact location to be given to the abutments in the implant meshwork and the height of the abutments.

The operation was performed in two stages, with an interval of four weeks between the first and the second operation. The technic was as follows: The patient was given bilateral anesthesia of the trunk near Spix's spine. A 2 per cent lidocaine solution was used. An incision was made along the crest of the mandible from the center of the jaw to the right and the left retromolar regions. At both ends of the incision, another incision, perpendicular to the first one, was made on each side. The mucoperiosteum was elevated lingually up to the point of insertion of the mylohyoid muscle, to the internal oblique line and vestibularly up to the external oblique line. Care was taken to locate the mental foramen with its vessels and nerves.

With the individual tray previously prepared, a plaster mold was taken directly from the bone which included all the surface of bone exposed for this purpose. The operative wound was then washed with saline solution, and the incision was closed with silk sutures which were removed on the seventh postoperative day. The patient was given antibiotics. The postoperative period was normal.

A Vitallium meshwork was constructed on the model obtained from the impression taken directly from the bone. The four abutments were placed, with the longitudinal axis perfectly parallel on the level of the two cuspids and the first permanent molars. The skeleton of the future prosthesis was constructed on the abutments.

The second operation for the application of the implant meshwork was carried out four weeks after the first one. The anesthesia, the elevation of the mucoperiosteum and the exposure of the bone were the same as in the first operation. The implant meshwork was applied over the exposed bone and fixed to the bone by means of very small Vitallium screws. These could be removed through a small incision, if they were not tolerated. After placement of the implant meshwork, the incision was carefully sutured, especially around the abutments. The patient was given antibiotics. The postoperative period was normal. The prosthesis was inserted five weeks after the second operation.

Metallic implants are well tolerated by organic tissues as shown by satisfactory clinical results reported in the literature. The implants are especially indicated when there is great resorption of the mandibular bone, when gingival hypertrophy

is present, and when patients have certain mental objections to the use of conventional prostheses. They are contraindicated for patients with diabetes, blood diathesis, endocrine disorders, disorders of the calcium metabolism, and diseases of the buccal mucosa.

Fixed prostheses in edentulous mouths by means of endomaxillary direct implantations (Protesis fijas en bocas edéntulas por medio de infibulaciones directas endomaxilares)

M. S. Formiggini. *An.españ.odontoestomat.* 16:675-684 Sept. 1955

The procedure for direct implantations was described by the author in *Rivista Italiana di Stomatologia* in March 1947. It consists of the implantation of small screws of inoxidizable steel wire in natural or surgically-formed alveoli. The screw is a conic or cylindrical spiral which is stabilized in all its length, except for its free end, on a central axis. The technic is as follows:

1. The alveolar processes are examined roentgenographically.

2. When natural alveoli are absent, surgical alveoli are formed by means of round burs of progressively increasing sizes up to the diameter of the cavity but smaller than that of the screw to be implanted.

3. The length of the screw and of its central axis is adjusted to the height of mastication by cutting to the appropriate length the free ends of both, the screw and its central axis, and soldering them so as to form a spike outside of the alveolar cavity. All spikes remain outside of the cavity perfectly parallel to each other.

4. The spikes of all the screws are then covered with small, well-adjusted gold tubes which in the course of the procedure become inserted first in the impression and later in the model. The gold skeleton of the prosthesis is made on the model at which time the gold tubes are soldered to it.

5. The teeth are fixed with synthetic resin to the gold skeleton of the prosthesis.

The prosthesis should be applied as soon as possible after implantation of the screws so as to take advantage of the alveolar reaction that follows implantation. Through this reaction the fibrous and bone tissue grows into the spirals of the screws and fixes the screws firmly into the alveolar cavity. The screws, being hollow and slightly flexible, are easily embedded in the maxillary and mandibular bones, and they soften trauma resulting from mastication. The number of screws employed for the fixation of prostheses varies with the type of prostheses—either partial or complete—applied. For complete prostheses in edentulous mouths, four screws are used, and they are preferably implanted in the posterior molars and the cuspids. The number of screws used and the place of implantation vary according to the complications in the bones, if any. The patients are given antibiotics and vitamins during the surgical treatment, and calcium tablets are given after completion of the treatment.

The author earlier reported satisfactory results of several years' duration from the use of partial prostheses in 18 patients. Satisfactory results of several months' duration were obtained more recently from the use of complete prostheses in two edentulous patients. The new surgically-formed alveoli, the parallelism of the spikes fixing the prostheses, and the complete prostheses already *in situ* in the two cases herein reported are illustrated. The surgical treatment was well tolerated, and immediate or late inflammatory reactions did not occur. The patients state that they are not conscious of wearing prostheses. Mastication is normal and the cosmetic results are excellent.

Autogenous transplant (Un caso de transplante augógeno)

Carlos Pérez-Martínez and Jorge Soto Peralta. *Rev.Fed.odont.Colombiana* 6:84-86 May-June 1955

The authors several times have carried out the autogenous transplantation of molars to replace others that had to be extracted. The subject of the present report was a 16 year old boy. The lower left third molar was to be transplanted as a substitute for the first molar on the same side, which was to be extracted. The crown of the third molar was completely formed and the root had started growing. Before the operation the patient's mouth

was thoroughly washed and he was given sedatives and an intragluteal injection of 400,000 units of penicillin.

The operation was performed under local anesthesia (lidocaine), in the following steps: (1) a deep incision, which included the periosteum, was made from the distobuccal region of the third molar along the gingival margin to a point in front of and beneath the second bicuspid; (2) the third molar was extracted, avoiding removal of bone around the crown or trauma to the root; (3) the lower left first molar to be replaced was extracted, the alveolus was widened and curetted and the third molar was planted therein, and (4) the flap of the transplant was sutured in good apposition by means of loose stitches with thread. The immediate roentgenogram showed the transplanted molar in good position. After the operation the patient was given chlortetracycline; he was told to wash his mouth frequently with saline solution, and he was given parenteral injections of penicillin in doses of 400,000 units each every other day for three days. There was no pain or edema. The patient resumed work the day after the operation. Healing was satisfactory. Roentgenograms were taken one month, two months and six months after the transplantation of the molar. The transplant "took" very well and the root developed normally. The crown is normal in clinical appearance and is in perfect occlusion. The gingival attachment is normal. The patient states that he has had no trouble at all with the transplanted molar.

▼ Extractions

The use of Cetrimide B.P. as a socket dressing

Arnold S. T. Frank. *D.Practitioner* 6:164-166 Jan. 1956

Cetrimide is a synthetic quaternary ammonium compound, cetyltrimethylammonium bromide, a creamy white powder, soluble in both water and alcohol. *In vitro* studies show it to be bactericidal and in high dilutions bacteriostatic, although not active against spores. It is most potent against gram-positive, and to a lesser extent against gram-negative, organisms.

The use of cetyltrimethylammonium bromide as a socket dressing for postoperative application after 22 tooth extractions and 63 instances of dry socket is reported.

A strip of half-inch sterile gauze tape was spread on both sides with the cetyltrimethylammonium bromide paste and rolled around dressing tweezers. On completion of the operation the dressing was inserted in the socket over the collapsed gingival flap. The patient was given a pressure pack to bite on for 15 minutes and then dismissed for three days with instructions to use hot water mouthwashes after meals.

On the second visit the gauze was removed, the socket irrigated, a new strip of the tape inserted and the patient told to return in four days. On the third visit the dressing was removed and the patient instructed to keep the region clean with saline washes. On the fourth visit the patient was discharged.

Of the 22 postextraction sockets treated, some degree of edema, trismus and postoperative pain was reported by the patients on the second visit. All the symptoms were absent at the third visit. All 22 patients were discharged on the fourth visit with satisfactory healing.

Of the 63 instances of dry socket, the patients had the typical symptoms—severe neuralgia, local inflammation and a mushy semi-fluid clot. On the first visit the socket was irrigated with warm saline solution and a cetyltrimethylammonium bromide gauze dressing, prepared as described, was placed in the socket. On the second visit, four days later, the dressing was removed, the socket irrigated, and the patient instructed to irrigate the socket and to return in three weeks. On the third visit the patient was discharged. Of the 63 dry sockets treated, there were no symptoms in 59 at the time of the patient's second visit. The other four patients had displaced their dressings on the day of insertion, but the sockets responded to a second application.

No concurrent control experiments were conducted. This small initial survey is intended to introduce the postoperative use of the quaternary ammonium compounds in the mouth. The advantages of cetyltrimethylammonium bromide as a

socket dressing are as follows: It is a potent antibacterial agent against most organisms found in the mouth; it has a low degree of toxicity; it is cheap and readily available; it does not harden and is easy to remove; it is stable on storage, and the taste can be masked.

A survey of the records of the extraction of 24,319 teeth

A. B. P. Amies and Vernon T. Sealey. *Australian J.D.* 59:394-396 Dec. 1955

The records of dental extractions came from the private practice of the second author, and they were surveyed in an endeavor to improve exodontic technics. Of the 24,319 teeth extracted, 1,395 (5.74 per cent) fractured during removal, leaving one or more root fragments in the jaw.

The teeth in which fracture of a root or roots is most likely to occur during extraction are, in order of decreasing frequency: lower second molar, upper first bicuspid, lower first molar and lower third molar, 12.5 per cent; upper first and second molar, 10 per cent; lower first and second bicuspid, 6 per cent; upper second bicuspid and upper third molar, 5 per cent; lower cuspid, 4 per cent; upper cuspid, 3 per cent; lower lateral incisor, 2 per cent; upper lateral incisor and lower central incisor, 1 per cent, and upper central incisor, 0.5 per cent.

A table indicates the number of times the various common technics—forceps, elevators and the open operation—were used to remove fractured roots remaining in the jaw. Forceps and the open operation were the technics most commonly used. For upper teeth the forceps method was the commonest (51.9 per cent), followed by open operation, 41.4 per cent, and elevator technic, 6.7 per cent.

In the lower jaw elevators were used in 30.6 per cent of the instances to remove roots, forceps were used in 23.4 per cent, and the open operation in 45.9 per cent.

A further study is planned to consider such relevant details as the amount of root fractured, the age of patients, carious involvement of the crown of the teeth, nonvital teeth, pathologic root changes and anatomic abnormalities.

Antibiotic treatment of the gingival sulcus in prevention of postextraction bacteremia

I.B. Bender and R.S. Pressman. *J.Oral Surg.* 14:20-28 Jan. 1956

Methods of preventing postextraction bacteremia were tested by comparing the effects of two different antibiotic troches (applied locally to the mouth before tooth extraction) with the effects of preoperative injections of penicillin. Saliva collected before and after the administration of antibiotics was examined for bacteria counts and types of bacteria. Blood samples taken before, immediately after and ten minutes after tooth extraction were cultured, and the types of organisms were identified. The following conclusions were drawn:

1. The theory is confirmed that the bacteria of postextraction bacteremia are the normal inhabitants of the mouth which gain access to the blood stream through the traumatized tissues of the gingival sulcus.
2. The incidence of bacteremia can be reduced by reducing the degree of trauma.
3. Local application of antibiotics in the form of troches slowly dissolving in the saliva under the conditions outlined can be more effective than intramuscular injections of penicillin in preventing postextraction bacteremia.
4. The antibiotic troches are effective in reducing the incidence of bacteremia after mild trauma, and are effective, although to a lesser degree, if the trauma is severe; penicillin administered by intramuscular route is effective if the trauma is mild, ineffective if the trauma is severe.
5. The most effective of the three antibiotic preparations tested was a troche containing penicillin, bacitracin, sulfadiazine and ethyl aminobenzoate. This troche, however, should be used as an adjunct, not as a substitute for, the parenteral administration of antibiotics.
6. If sensitivity to penicillin is a factor, the troches containing neomycin, polymyxin B sulfate and zinc bacitracin can be used.
7. Rules are outlined to protect patients with heart damage against the subacute bacterial endocarditis which often is a sequel of oral surgical procedures.

Hemophilia (Hämophilie)

A. Fonio. *Zahnärztl.Welt* 10:495 Oct. 10, 1955

Hemophilia, characterized by a prolonged coagulation time and abnormal hemorrhage, is a sex-linked, hereditary disease, occurring only in males but transmitted by females.

In differential diagnosis, the determination of hemophilia is not difficult although some of the symptoms are similar to those of gingivitis. In the different types of gingivitis, despite a continued serious inflammation of all gingival tissues, hemorrhage seldom occurs.

A copious flow of blood from injured vessels, either after tooth extractions or during the eruption of the permanent teeth, indicates the presence of hemophilia. Frequently, however, the flow of blood does not appear immediately after the extraction but as a secondary phenomenon.

The recommended therapy consists in an immediate closure of the alveolus with a gelatin sponge saturated in thrombin, a compressive bandage with tampons impregnated in hemostatic solutions, and a firm fixation with protective dressing. The mandible should be held in occlusal position with a four-tailed jaw bandage. Only liquid nutrition should be given, by glass tube. The tampons should be changed daily. When a second hemorrhage occurs, all dressings including the gelatin sponge must be renewed.

In severe hemorrhage, blood transfusion and the administration of fresh organ or tissue extracts is necessary.

To avoid unfavorable complications, the tooth extraction should be performed with little or no loss of blood. Small rubber bands, applied around the tooth to be extracted, should be moved slowly in an apical direction. To permit the application of these bands, tooth and root remains should be extracted only after a cap with a root peg is affixed. The extraction of multirooted teeth should be performed only after the root bifurcation is exposed, and the isolated roots should be treated as if they were single-rooted teeth. Only one surgical procedure should be undertaken in one session, and the extraction should not be completed in less than one week. When tooth extractions are necessary in hemophiliacs with a comparatively prolonged blood coagulation time (from 4 to 7 hours), a transfusion should be given before surgical intervention with fresh and not stored blood serum. Favorable results are achieved by blood plasma transfusion after medication of vitamin C and P preparations. A continued supply of thromboplastic substances, obtained from the brains of cattle, and given in the form of blood platelets, expedites the coagulation.

▼ Anesthesiology and analgesia

Analgesia with Trilene and nitrous oxide

L. Fergus Taylor. *New Zealand D.J.* 51:149-152 Oct. 1955

There is no more appreciative patient than the nervous and apprehensive person for whom pain is eliminated. Were it not for fear of the pain of dental work, there would be far fewer edentulous patients. Modern dentistry can be painless. For conservative work, a mixture of nitrous oxide and trichloroethylene (Trilene) combines the better properties of the two gases and eliminates many of the less desirable qualities of each.

Although both drugs are effective in reducing pain in the very early stages of induction, the desired effect is obtained with trichloroethylene with slightly less depth of anesthesia. Most of the untoward results of analgesia are caused by the patient's going into the second stage of anesthesia. To avoid a fluctuating light anesthesia, it is necessary to understand the second stage symptoms—usually vertigo, loss of consciousness, increased pulse volume, increased respiration with emphasis on inspiration, muscular relaxation, dilatation of the pupils, slight coloring and restlessness. There may be phonation and movement of the eyeballs. If the operator is in doubt as to the stage of anesthesia, he should give more oxygen.

When a mixture of nitrous oxide and trichloroethylene is given, premedication is usually unnecessary. A small nasal inhaler is used with tubes which can be tightened behind the patient's head. A thin sponge rubber pad, trimmed to lie under

the nosepiece, increases the comfort and snugness of the fit. A satisfactory, steady plane of analgesia should be reached as soon as possible.

With an apprehensive patient, a slow induction adopted with the idea of building up confidence will usually have the opposite effect. Three to seven per cent of nitrous oxide and a small opening of the valve over the trichloroethylene will usually produce the desired result. At all times an attempt should be made to keep the patient on the upper border of consciousness, responsive to requests, aware of all that goes on. The optimal period for maintaining analgesia is between 20 and 30 minutes. An adequate suction apparatus is essential, since the patient cannot rinse.

Recovery is nearly always rapid and uneventful. The avoidance of food prior to operation is of no advantage.

Considerations in the administration of a general anesthetic

T. J. Niddifer. *J.Missouri D.A.* 35:14-17 Oct. 1955

Much of the success in dentistry results from the dentist's ability to control pain resulting from operative and surgical trauma. General anesthesia plays an important role in the control of pain. One who assumes the responsibility of administering a general anesthetic should receive academic and technical training beyond the undergraduate level. In most branches of medicine and dentistry, a mistake usually can be corrected at some later date without endangering the life of the patient. In general anesthesia there may be only three or four minutes in which to correct a condition that otherwise will prove fatal. A series of measures is suggested for increasing the safety factor in anesthetization and promoting the comfort and well-being of the patient.

If possible, the patient should be seen on a day preceding the administration of a general anesthetic for the purpose of obtaining a history and making a physical examination, explaining the procedure, and alleviating apprehension.

Each patient should be asked to answer 18 questions relating to his experience with general anesthesia and his history. The physical examination should include the following tests: breath-holding, heart sounds, pulse, blood pressure, hemoglobin determination and sedimentation rate.

Whereas the normal individual can hold his breath for approximately 45 seconds, an individual with a cardiac, anemic, tuberculous, thyroid or diabetic condition can hold his breath for only 10 to 25 seconds.

In listening to the heart sounds, the operator should be able to recognize auricular fibrillation, extrasystoles, respiratory arrythmia, tachycardia, bradycardia and heart block.

The rate, quality and character of the pulse and changes in pulse pressure, correlated with blood pressure, constitute important guides to the patient's condition while under a general anesthetic.

The arterial blood pressure should be determined on all patients prior to and during general anesthesia.

Hemoglobin determination is possibly the most important diagnostic factor in the consideration of the administration of a general anesthesia.

Sedimentation rate is important in determining the presence of chronic or acute infection which may alter the patient's reaction to a general anesthetic. Sets for administering these last two tests that can be used in the office are available at almost any medical supply house.

The patient or his parent should sign an authorization for the administration of the necessary anesthetic agents, and the performance of operative procedures under anesthesia. A sedative should be prescribed, to be taken by the patient the evening before. The patient should be instructed to cease taking food and drink four hours prior to the anesthetic. General instructions are listed for managing the patient in the office.

New concept of nitrous oxide anesthesia

J. Harold Klock. *Anesth.& Analg.* 34:379-384 Nov.-Dec. 1955

Nitrous oxide with oxygen, still the most commonly used general anesthetic agent in the dental office, has created hazards because of its inability to produce consistently a state of surgical narcosis without hypoxia. Oxygen lack may injure the tissue and lead to asphyxia or death. Despite knowl-

edge of the hazards of hypoxia, nitrous oxide still is administered generally in dental offices with an oxygen flow as low as 5 per cent of the total.

A technic is described to produce "amnalgesia," that is, "a plane of surgical anesthesia between the so-called analgesia plane and the second or excitement stage, wherein surgical operations may be performed without pain or memory." The amnalgesic plane is surprisingly wide and is easily recognized and controlled by the well-trained anesthesiologist.

The anesthetic gas machine is adjusted to deliver a mixture of 20 per cent oxygen and 80 per cent nitrous oxide at a positive pressure of 7 mm. of mercury. After the nosepiece is applied, the mouth prop is inserted and the mouth pack placed in the anterior portion of the mouth. A damp (not cold) towel is placed over the mouth to prevent mouth breathing. The nitrous oxide proportion should never exceed 80 per cent.

As the induction progresses to the point at which the eye becomes fixed, restraining straps should be applied carefully and gently. When the eyeball starts to move off center or to roll slightly, the operative field can be anesthetized with procaine, if desired, without the patient's feeling or remembering the local injection. If there is no blinking of the eye to the finger and the eye is off center, the operation may be started. Should the patient enter the excitement stage, more oxygen should be administered; as soon as the patient becomes quiet, the operation may be resumed. In approximately 10 per cent of the instances, the patient will not pass into a plane deeper than the analgesic stage; for these patients supplementary anesthesia may be necessary, using trichloroethylene, vinyl ether or other anesthetic drugs.

In amnalgesia the patient is completely relaxed. The mouth prop may be removed and replaced without difficulty. Since the patient has not lost the gag reflex, there can be no aspiration of fluid into the lungs, nor can there be respiratory failure because without hypoxia there can be no insult to the respiratory center. In more than 7,000 administrations, no sudden and alarming drop in blood pressure has been noted. The general anesthesia may be continued for hours. The longest office anesthetic procedure of this type to date has been 2 hours and 40 minutes. Recovery is amazing; the patient usually arises feeling normal almost immediately after surgery. Most operations can be performed without premedication. The surgeon is relaxed because he knows that the patient is as safe when this anesthetic technic is used as when a local anesthetic is used. With this procedure, impacted upper third molars can be removed with the jaws in "closed" position; a complete mouth extraction and alveolectomy can be performed at one sitting; a gingivectomy can be completed at one sitting; four impacted teeth may be removed at one sitting; extractions and frenotomy for children are easily accomplished; apicoectomy is made easy, and operative dentistry for children and adults is facilitated.

Laryngeal spasm: causes, prevention, and treatment

Charles H. Redish. *Oral Surg.,Oral Med. & Oral Path.* 8:1139-1145 Nov. 1955

The increased use of thiopental sodium in dental offices has resulted in an increase in the incidence of laryngeal spasm during general anesthesia.

Among the common causes of laryngeal spasm are the following: the sudden introduction of a high concentration of an irritating inhalation agent; the presence of foreign bodies in the laryngeal region; stimulation of the recurrent laryngeal nerve; relatively large doses of a high concentration of thiopental sodium given very rapidly, and an attempt at endotracheal intubation at too light a stage of anesthesia.

Every effort must be made to keep the throat clean, dry and free of foreign bodies. The anesthetic agent should not be introduced too rapidly or in high concentrations. Surgical procedures should not be begun until the patient is in the proper stage of anesthesia. Preoperative sedation with such agents as sodium pentobarbital or phenobarbital (0.1 to 0.2 Gm.) will make the patient less apprehensive and more amenable to smooth induction and maintenance of anesthesia.

Once laryngeal spasm is observed, the anesthetist must work quickly and surely to regain an open airway to the lungs and restore respiration. Surgery should be stopped immediately. The oropharynx should be aspirated and examined for the presence of foreign bodies. The tongue should

be pulled forward and the mouth and throat inspected. If inspection reveals nothing and aspiration has not resulted in the return of normal respiration, positive-pressure oxygen should be used in an attempt to break the spasm. If the spasm persists, an endotracheal tube is passed between the adducted vocal cords. Recently, the use of a muscle relaxant to correct the spasm has been advocated. Succinylcholine produces relaxation within 30 seconds to one minute. It is used intravenously in does of 10 to 30 mg. in a single injection. Where intubation is impossible and succinylcholine is not available, a tracheostomy must be performed.

The dentist should prepare an emergency tray bearing the armamentarium necessary to deal with laryngeal spasm, and should always have it available for use.

▼ Fractures

Mandibular fractures— a review of their treatment

Edward C. Thompson, Harry Shaver, Jr., and F. Robert Christopher. *Illinois D.J.* 24:737-744 Nov. 1955

Mandibular fractures sometimes are not recognized immediately and may not be diagnosed for days. Subjective symptoms include any history of trauma to the jaws, pain, tenderness and loss of function. Objective symptoms include occlusal deformity, crepitus, mobility, discoloration and swelling. Positive diagnosis is made after a thorough roentgenographic examination.

Any part of the mandible may be a site of fracture. The most frequent site is through the mental foramen region of the body; the least frequent is the coronoid process. Direct and indirect fractures commonly accompany one another. When a fracture of the mandible is suspected, roentgenograms must be made to evaluate the possibility of two or more fracture sites.

Treatment consists of reduction and fixation of the fragments in as nearly normal a position as possible. More accurate reduction is essential in the mandible than in other bones, as the establishment of normal function is more critical.

A first step in planning the treatment is to treat prophylactically against tetanus. Generally, 600,000 units of penicillin G or penicillin preparation, parenteral, are given immediately and daily for from four to six days to prevent or minimize subsequent infections. Pain and edema are the other factors requiring immediate medication; morphine and codeine are more efficacious than meperidine in relieving pain.

In comminuted fractures the removal of bone fragments leads to better reductions and healing.

In most mandibular fractures occurring anterior to the angle, one or more teeth are involved in the fracture sites. The retention or removal of the tooth must be decided on the individual circumstances. Impacted third molars are the teeth most often involved in fracture sites; bicuspids are frequently involved also, because of their relation to the mental foramen. Because a tooth involved in a fracture line often predisposes toward complications and a poor end result, such a tooth should be retained only rarely.

Soft tissue wounds should always be cared for in conjunction with the fracture reduction at the earliest possible time. Soft tissue wounds and mandibular and other facial fractures deserve more particular attention in emergency care than do those elsewhere on the body because of the esthetic importance of the face.

Healing time will depend on the patient's age, maintenance of oral hygiene, type and location of the fracture, and the success of reduction and fixation efforts. In the average situation, good knitting and union of the fracture can be expected in four to five weeks in a child, and six to eight weeks in an adult.

The words of Colonel Richard J. Burch are recalled approvingly: "Management of fractures of the facial bones requires a complete knowledge of the anatomy and pathology of the jaws and associated parts. Since this can only be acquired in the dental school curriculum, it is clear where complete responsibility for treatment lies. . . . With the advent of antibiotic therapy, reduction by transosseous wiring has come to the fore. The superior results in function and facial symmetry obtained in open reduction far outweigh any minor incisional defect."

Armamentarium

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Equipment

NBS-AF panoramic x-ray machine speeds examination and reduces radiation

Nat.Bur.Standards Tech.News Bul. 40:1-3
Jan. 1956

An x-ray machine that rapidly takes a single panoramic roentgenogram of the entire dental arch has been developed by the National Bureau of Standards in cooperation with the U.S. Air Force Dental Service and School of Aviation Medicine. The panoramic machine should be particularly useful to the Armed Forces in taking full mouth dental roentgenographic surveys of inductees, and should find application wherever large numbers of the people are examined for dental defects.

In the new panoramic machine, the film is placed outside the patient's mouth and is exposed by passing a narrow beam of roentgen rays through his head. A panoramic roentgenogram of all the teeth and associated structures is obtained on a single 5 by 10 inch film in about 40 seconds. The roentgen ray source and the film holder travel in semicircular paths on opposite sides of the patient's head. Above the patient's head is a cam curved in the shape of the average dental arch. As the cam rotates, a cable wound about the cam moves the film within the holder. As a result,

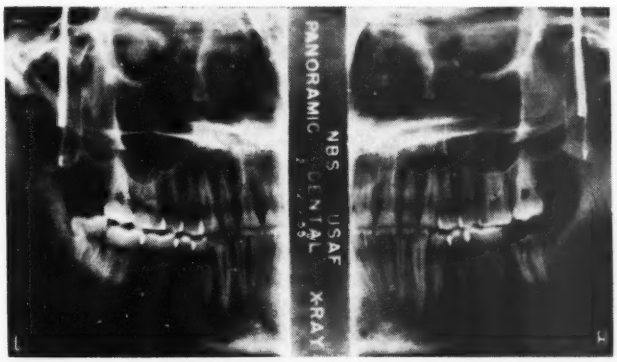
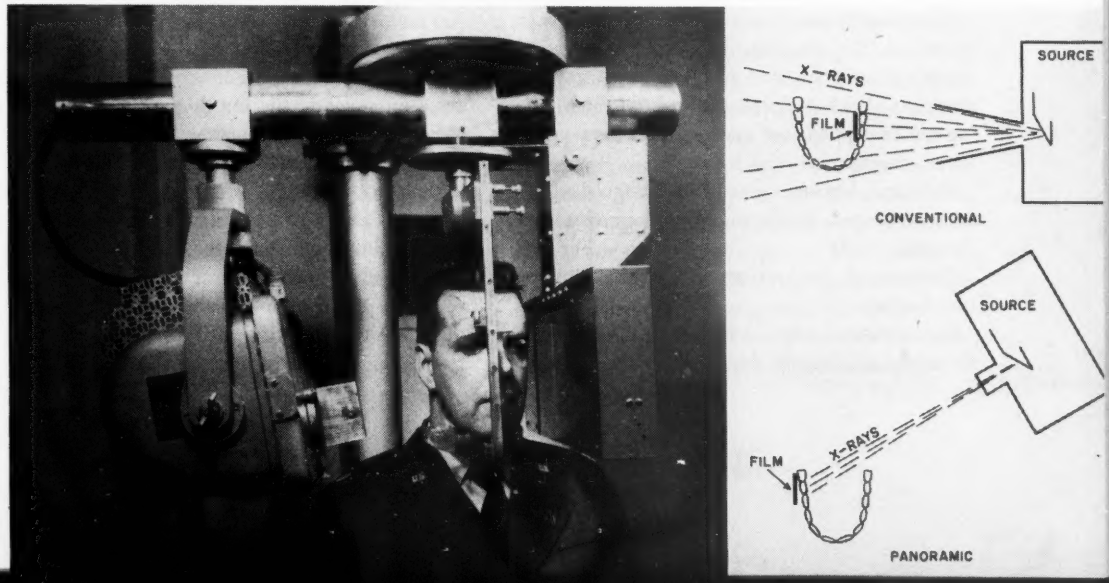


Figure 1 The machine takes a single roentgenogram of the entire dental arch. The roentgenogram shown was made on a phantom head. The strip in the center normally carries the date and the patient's name

Figure 2 This is the first model of the machine. The patient sits in a dental chair beneath the rotating arm and is positioned by means of a chin support



the film travels at a rate which conforms to the size and shape of the dental arch.

The first model of the panoramic x-ray machine is now undergoing performance studies. In this model the patient sits in a dental chair beneath the rotating arm and is positioned by means of a chin support pivoted from a stationary point on the machine. The chin support steadies the head and places the dental structures in the proper position for projection onto the moving film. Future models of the machine may be so constructed that the subject need not sit but may have roentgenograms taken while standing, to reduce further the time needed for a dental survey.

Transillumination as an aid in dental diagnosis

M. A. Abdalla. *Egyptian D.J.* 1:9-11 Oct. 1955

Transillumination consists of directing a highly concentrated, tissue-penetrating equichromatic light through the tissue to be examined. By virtue of the reflection and selective absorption, it is possible to see the condition that exists. The theory of diagnosis by transillumination is based on the change or deoxygenation shown in the blood when a pathologic change occurs. A normal condition is indicated by a clear pink translucency. The blood in the soft tissues of the mouth shows even the slightest change. The healthy red corpuscles are translucent, but when infection causes congestion, oxidation and deoxidation of these corpuscles, a dense area is created which appears darkened or opaque. Nontranslucent areas always indicate infection.

For transillumination, a completely dark room is needed. The apparatus consists of an intraoral lamp with a graduated rheostat to control the amount of light. A sleeve of metal or rubber tubing can be slipped over the end of the lamp when more concentrated light is needed.

Calculus deposits are easily distinguished by crescent-shaped shadows of varying sizes and densities.

Periodontal diseases are shown by lack of translucency.

Interproximal cavities, intercoronal caries and the extent of fillings in the crowns of teeth can be detected by transillumination. The technic is used in root canal treatment to ascertain the length of the root and the progress of instrumentation.

Transillumination is useful for diagnostic purposes in the mouths of children.

In transilluminating teeth the light should be held lingually or buccally about half an inch away. The light should not be held directly against the teeth. The entire alveolar process and the teeth should be viewed from both the buccal and lingual surfaces with light. The intensity of the light should be varied, because small diseased areas will show up under a faint light and not under a stronger one.

Fractures, malformation, and impacted or unerupted teeth are not shown by transillumination, nor are all infected areas revealed. With this technic it is also difficult to diagnose periapical infection if there is no involvement of the soft tissues, or early acute inflammation of the soft tissues. Despite these limitations, transillumination deserves a wider use.

Projecting dental radiographs

H. H. Holliger. *D.Radiog.&Photog.* 29:10-12 Jan. 1956

When conditions like incipient decay at the gingival margin call for extensive work, the patient can be helped to an understanding of the situation by being shown projected roentgenograms. It is also helpful to show the patient some representative records of conditions similar to his own. A selected group of permanent roentgenographic slides provides rich educational material.

Proof of the benefits of projection is obtained by first asking the patient if he can see the carious areas in a roentgenogram. Some may be able to see these small details, but they will be uncertain. When the same roentgenograms are projected, the patient appreciates the conditions shown. The pathologic condition is depicted on a large enough scale for its seriousness to be apparent.

An ordinary projector for 2 by 2 inch slides serves to show roentgenograms. Roentgenograms can be mounted in hinged slides. Two squares of glass are taped together along one edge. The roentgenogram is slipped into a Kodak mask for

glass slides, and the combination is placed between the hinged glass. A half inch piece of tape serves as a temporary latch.

A good projection distance is from three to six feet in a moderately lighted room with the overhead light off. Three feet is probably the best distance for 300-watt projectors. The image size will be about 8 by 12 inches at that distance. A tall cabinet behind the chair provides a convenient support for the projector. A smooth, white card forms the best screen. One of the window shades can serve as a screen.

The dentist wishing to utilize this procedure should consider a good projector. It will be an asset for other uses, such as lecturing to dental groups and showing personal slides. It costs little more in money and effort to provide adequate facilities for this important application of dental photography.

▼ Materials

A simple method of increasing the adhesion of acrylic filling materials to enamel surfaces

Michael G. Buonocore. *J.D.Res.* 34:849-853 Dec. 1955

A major shortcoming of acrylic resin and other filling materials is their lack of adhesion to tooth structure. A filling material capable of forming strong bonds to tooth structure would offer many advantages. With such a material there would be no need for retention and resistance forms in cavity preparation, and the effective sealing of pits, fissures and beginning carious lesions could be realized.

A simple method of increasing the adhesion of acrylic filling materials to enamel surfaces has been developed, whereby the tooth surface is altered by chemical treatment.

Two treatments were used. The first involved the use of a 50 per cent dilution of a commercial phosphomolybdate reagent containing sodium tungstate (Folin-Wü) in conjunction with a 10 per cent oxalic acid solution. A small drop of the molybdate reagent was applied to the labial enamel surface of upper and lower incisors (and occasionally bicuspids and molars) of volunteer subjects. The reagent was rubbed over the enamel surface for 30 seconds. The solution was dried on the enamel surface to a thin, moist film, utilizing compressed air. A drop of the 10 per cent oxalic acid solution was applied directly over the area and rubbed in until a white precipitate formed, which was then air-dried to form a white, opaque surface. This surface was flushed with warm water while being rubbed with a cotton pledget.

The surface was then dried with compressed air just prior to application of drops of an acrylic filling resin, each drop being about 5 mm. in diameter. After the drops had hardened, they were smoothed off with sandpaper disks. On the control teeth, drops of water were used in place of the acids.

On 15 untreated tooth surfaces, the average duration of adhesion was six hours; on 15 treated surfaces, 160 hours.

The second method of surface treatment employed 85 per cent phosphoric acid, to determine the effect of a simple acid decalcification on adhesion. The method used was the same as previously, except that the drop of acid was washed off with water after the 30 second contact with the surface. On ten untreated (control) surfaces the average duration of adhesion was 11 hours; on ten treated surfaces, the average duration of adhesion was 1,070 hours. The acrylic drops on five of the treated surfaces were removed mechanically. This removal required considerable force with a sharp instrument and in about half the instances resulted in fracture of the acrylic resin rather than clean separation from the surface. The drops on the remaining five treated surfaces were still on the teeth 90 days after application, in spite of repeated attempts to remove them by strong thumbnail force.

Further experiments are indicated to test the resistance of the bond to acid and bacterial action, and to evaluate moisture resistance over periods of time comparable to the service life of a restoration. Even at this present stage, however, these observations open a new approach to the problem of obtaining adhesion of acrylic materials to teeth, to increase the usefulness of these materials.

Basic science

▼

Histology

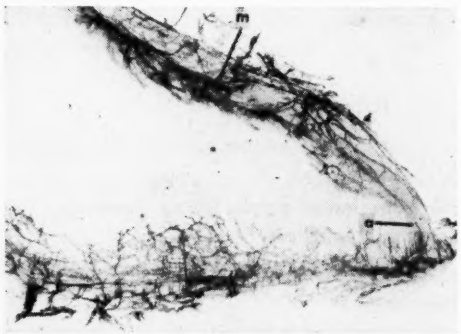
The vascularity of the articular disc of the temporomandibular joint

D. Walter Cohen and Gerard J. Keller.
Alpha Omegan 46:104-105 Sept. 1955

The articular disk, or meniscus, is one part of the temporomandibular joint that has aroused considerable interest. Conflicting views of the physiology of this joint have been derived from observations of the histologic character of the disk and its vascularity. Because the vascularity of the disk is not only of anatomic interest but has possible clinical implications, the authors have initiated a series of studies to trace the blood supply of the disk in various animals. This report deals with the findings in the temporomandibular joint of the dog.

Standard histological procedures are not satisfactory in attempting to visualize the blood supply of oral tissues. The authors sought a refinement of the injection material. India ink was subjected to vacuum filtration, high speed centrifugings, repeated filtrations and microscopic examination during various stages of the procedure. The final product consisted uniformly of particles less than 1 micron in diameter. Perfusions and injections were done via the common carotid artery of the anesthetized dog.

The perfused and cleared specimens revealed a plexus of vessels supplying the capsule of the temporomandibular joint. These vessels arise from the superficial temporal branch of the external carotid artery. The disks were dissected out, stripped of the capsular tissue and cleared. As Sicher has observed, the central part of the disk is thin and avascular. A number of arterioles enter the posterior part of the disk from a superior course. These vessels supply the fibrous tissue making up the posterior one sixth of the disk. Additional vessels along the medial and lateral walls of the meniscus extend 2 to 3 mm. over the temporal and mandibular surfaces, but do not seem to anastomose with the posterior group. Capillary loops penetrate the collagenous tissue of the disk at these regions. There are a few small vessels at the anterior border; they do not infiltrate the substance of the disk, and the plexus is not as rich as the posterior and lateral borders.



A medium power photomicrograph of the disk: a, anterior border; m, medial surface. The vessels on the medial and lateral borders are prominent and extend from 2 to 3 mm. over the temporal surface

Tissular calcipexy

(Les calcipexies tissulaires)

P. L. Maronneaud. *Cah.odontostomat., Marseille* 5:41-52 June-Dec. 1955

The term calcipexy describes the fixation of calcium in tissues within the human organism. Although some of the tissues, such as enamel, are of ectodermal origin, the calcipexic action generally is carried out by the connective tissue. The calcipexic function begins during the early period of tissular development from undifferentiated cells of germinal strata in embryos, causing the formation of hard tissues such as bones and teeth.

Calcipexy, therefore, is the ultimate phase in a series of complicated, parallel and independent actions and reactions, linking together organic and mineral formations under the apparently constant and powerful influence of cylindrical connective tissue cells (odontoblasts and osteoblasts). In normal development, this calcipexic action (ontogenic calcipexy) "correctly set," permits the development and repair of the skeleton. Periodontogenic calcipexy maintains the durability of the hard tisues and permits the reconstruction of the osseous structures after trauma.

Pathologically, calcipexic disturbances are responsible for structural anomalies such as frequently occur in osteopetrosis, rickets, reticuloendotheliosis, hyperplasia and neoplasia, appearing in different forms in adults and children.

In the development of the teeth, however, the calcipexic process is similar to but not identical with calcipexy during the skeletal formation. The complicated, organic, nitrogenous compounds that form the principal constituents of the cellular protoplasm (protein), mineral salts, and specific cell types (ameloblasts and cementoblasts) are dissimilar to the essential parts of the skeleton.

During the odontogenic period, calcipexic disturbances may cause dysplasia—pathologic and traumatic lesions that occur in enamel and in oral bone structures. During the periodontogenic period, incidental appearances of sessile or pedunculated pulp nodules may occur which usually are connected to the walls of the pulp chamber ("eburnolites").

In the center of the involved tissue structures, pure precipitation can be observed, but no organic or cellular reaction. These formations are anhistic calcipexies, true calculi or other abnormal concretions. Such formations can be caused by metabolic disturbances, in chronic infections of the glands, in senile "evolution" of arterial walls or encephaloid structures, and in different types of tumors.

In the vicinity of the cochlear recess, calcipexy appears in the form of regular spherical globules of various types. In the region of the teeth, calcipexy can be observed in the vicinity of the pulp.

The chemical composition of all calcipexic phenomena is not established as yet; however, they may cause severe disturbances in the region of the parenchyma of the pulp.

Comparison of tissue response to rotary and ultrasonic dental cutting procedures

Louis S. Hansen and Arne G. Nielsen. *J.A.D.A.* 52:131-137 Feb. 1956

A limited study concerned with the comparative biologic response to rotary and ultrasonic dental cutting is reported. Forty guinea pigs from the Naval Research Institute were used. One of the four continuously erupting incisors in each animal was cut with the ultrasonic vibration process; one other incisor was cut with a conventional rotary instrument and the remaining two incisors were left uncut for controls. After a two week postoperative period, the jaws of the animals were removed, separated in the midline, fixed in 10 per cent Formalin and decalcified with a chelating agent. The specimens were embedded in paraffin, and longitudinal sections 7 microns thick were made at different levels in the block, stained and examined histologically. Sections of 18 teeth proved unsuitable for evaluation. The remaining 142 sections were placed in five groups.

Group 0 revealed no significant deviations from the normal. Of the 83 specimens placed in this group, 61 were from teeth that had had no cuts made, and 22 were from teeth cut by conventional rotary methods.

In group "plus one," significant alterations were minimal and were limited to the ameloblastic layer of epithelium. Of 34 specimens placed in this group, 12 were in the control group,

12 in the group cut by conventional methods, and ten in the group cut ultrasonically.

In group "plus two," the changes in the ameloblastic layer were more extensive than in group "plus one." Six sections, all from the ultrasonic group, were classed here.

In group "plus three," in addition to the ameloblastic alterations, extensive disturbances in the dentin, odontoblastic layer and pulp were present. Nine specimens, all from the ultrasonic group, were placed here.

In group "plus four," the defect in amelogenesis was again present, and, in addition, enamel formation had ceased, as had dentin formation. Ten sections were placed here, all from teeth cut by the ultrasonic method.

Every tooth in the ultrasonic group exhibited alterations ranging from "plus one" to "plus four," whereas in the rotary and control groups less than a fourth of the teeth revealed changes, and these were never more than minimal.

It would appear that in operations on the incisor teeth of guinea pigs, some factor connected with the ultrasonic dental cutting instrument instituted changes of a more severe nature than those associated with the conventional cutting instrument.

▼

Bacteriology

Bacteriostatic effects of saliva and mucous membrane

(Über die bakteriostatische Wirkung des Speichels und der Mundschleimhaut)

E. Schlander and M. Hussarek.

Wiener klin.Wschr. 67:642-645 Sept. 1955

The self-curative ability of oral tissues frequently has been described in medical and dental literature. Injuries in the oral cavity, after an exact suture and hemostasis, often heal by first intention. In most other parts of the human body, injuries, despite treatment, are often followed by dangerous bacterial infections. No other part of the body has anything comparable to the bacteriostatic quality and quantity of the oral flora in the saliva and the mucous membrane. Therefore, the low degree of virulence of the oral flora and the self-curative ability of the tissues in the oral cavity can be explained only by the positive chemostatic characteristics of saliva and mucous membrane.

Of all body fluids, the saliva is of most immediate interest to the dentist. Its 0.3 to 0.7 per cent of solid matter contains a multitude of constituents. Normal average value of the ingredients of saliva has not been determined, although it has been claimed frequently that many of the chemical components of saliva are useful as indicators of caries susceptibility.

Proteins in human saliva are the principal organic constituents but they were neither analyzed nor characterized.

The presence of numerous enzymes has been reported in human saliva. Among them are amylase, lipase, invertase, maltase, phosphatase, oxidase, urease, hyaluronidase, lysozyme, carbonic anhydrase and proteolytic enzymes.

The presence of hormone-like substances in human saliva has been reported frequently, but the accuracy of these reports has not been established.

Examination of sputum secretion furthers the solution of the problem as to whether saliva itself can arrest bacteria appearing in inflammations or infections of the oral cavity. Pure saliva (filtrated and free of oral flora) cannot check coliform bacteria, streptococci, *Corynebacteria diphtheriae* or *Salmonella typhosa*. Therefore, human saliva does not have a true bacteriostatic effect. It is possible, however, that for some invading bacteria, the oral cavity provides an environment unfavorable to their existence and propagation.

Recently, the enzyme theory clarified the problem of virulence of *Corynebacteria diphtheriae* by revealing that the activity of the invading microorganisms decreases whenever and wherever they are brought in contact with mucin. The hyaluronic acid also may play a major part in the antibiotic effect.

The surface of cells is covered with dense acidulated layers. Many species of bacteria also possess a similar compact covering. Hyaluronidase, produced by invading bacteria, penetrates the cellular covering and acts as a spreading factor. The balance between polysaccharides and

hyaluronidase then regulates this spreading. This action and the arresting reaction of hyaluronidase produced within the human organism were observed with invading streptococci, staphylococci and pneumococci.

The attacked organism is able to produce its own hyaluronidase to counteract the effect of the hyaluronidase produced by the invaders. Specifically produced hyaluronidase destroys the surface strata of many species of bacteria and promotes phagocytosis.

▼ Pathology

Dentomaxillofacial characteristics in mongolism (Contributo allo studio dei caratteri dento-maxillo-facciali nel mongolismo)

Elvio Magri. *Acta stomat.Padua* 2:119-128 April-June 1955

Mongolism is a condition in which patients have specific facial expressions and appearances such as oblique eye-slits that resemble oriental types, abnormal flattened skulls and disturbances in bones and joints.

The cause of mongolism is unknown. Many authors consider this condition as a reversion to a primitive Mongolian type, others find an etiologic relationship between its occurrence and the age of the patient's mother. Among children born to mothers of an advanced age, there is a higher frequency of mongolism. Some reports regard alcoholism, syphilis, heredity or endocrine disturbances as causative factors. No specific pathogenic theory, however, has been accepted generally.

Patients affected by mongolism have a remarkable resemblance to each other, and a large number of physical anomalies have been observed in practically all those patients; for example, slant eyes, widely spaced with a narrow palpebral fissure and epicanthal fold; an unusually thick tongue which constantly projects out of the side of the mouth and which becomes more pronounced with advancing age; a flat face with a broad nose; a high palate and small teeth. The body weight usually is below normal. Fingers and toes are short and fat, the thumbs stubby; the big toe is set apart from the other toes. Physical development usually is retarded, and rarely progresses after the age of 15 years. The mentality is defective and varies from that of an extreme imbecile to a high-grade moron. Most patients easily succumb to infection and die before the age of puberty.

The Dental Clinic of the University of Padua, Italy, investigated the dentomaxillofacial aspects of mongolism. These studies revealed not only the generally known characteristics but also some symptoms similar to myxedema, such as boggy swellings of the face and hands, smallness of the thyroid gland, falling out of the hair, sluggishness of movements and retardation of the rate of basal metabolism. In addition, a sagittal underdevelopment of the skull, a rectilinear profile, a V-shaped mandible, severe facial asymmetry, hypertrophy of the tongue, and various dental anomalies were observed. In most of the patients examined, a relationship between essential constitutional characteristics, facial dimension, and the profile was observable.

In most instances of mongolism, neither the orthodontic nor the general prognosis is favorable.

Facial abscesses and facial phlegmons (Über Gesichtsabszesse und Gesichtsphlegmonen)

Stefan Kóváry, Budapest. *München.med.Wschr.* 97:1641-1643 Dec. 9, 1955

Three different forms of suppurative inflammation in oral and facial regions should be distinguished clearly: acute inflammation appearing on surfaces only, abscesses and phlegmons. These inflammatory conditions can become suppurative, especially when they occur on the skin or the mucous membrane. Abscesses are localized collections of pus in cavities formed by the disintegration of tissues, and phlegmons are pus accumulations spreading to the tissue spaces in a direction parallel to the surface.

Osteitis, osteomyelitis, traumas and infections in the anterior part of the head or in the oral cav-

ity may lead to the formation of abscesses or phlegmons. Facial abscesses usually appear in strictly circumscribed sites; facial phlegmons, however, tend to run a progressive course often leading to ulceration. Abscesses can be opened intraorally. In facial phlegmons, however, deep incisions into the region of inflammation are necessary to eliminate phlegmonous formations.

In instances of facial phlegmons, an accurate differential diagnosis is important in order to distinguish them from other inflammatory diseases such as those originating in the auricular region, the parotid gland or lymph glands, but spreading to the maxillofacial region. As a secondary phenomenon, an inflammation of the facial connective tissue may occur resembling true facial phlegmons.

In many instances of both facial abscess or facial phlegmons, the reparative process has begun almost as soon as the inflammation becomes evident. In inflammations where there is little injury to tissue, repair may be complete. If there is a more severe destruction of tissue, however, the condition may improve, but with production of scars and without a full restoration of the destroyed tissue.

Hyperparathyroidism

Sylvester Koontz. *North-West Den.* 34:331-333 Nov. 1955

This disease, first described by von Recklinghausen in 1891, is caused by the production of more parathyroid hormone than is needed by the body. Pain in the bones and joints is the most prominent symptom. The skeleton undergoes generalized changes that vary from demineralization to cysts, tumors, pathologic fractures and deformities. The skull frequently shows a diffuse demineralization. Polyuria and polydipsia are common symptoms. Hypercalcemia may cause weakness, fatigue, nausea and vomiting, dryness of the mouth and dysphagia. Muscle weakness and weight loss often follow. Diagnosis is based on the biochemical and roentgenologic abnormalities noted.

Oral symptoms are confined largely to changes in the density and structure of the maxillary bones. These changes may consist of a diffuse demineralization, or single or multiple cysts. The cysts, sometimes referred to as osteoclastomas, are thought to be caused by large collections of osteoclasts associated with hemorrhage or degeneration and may include foreign body giant cells. Strock states that "Mild degrees of osteoporosis are more readily detected in oral radiographs than elsewhere because the teeth, the density of which is unaffected by hyperparathyroidism, serve as indices of opacity."

The loss of lamina dura is significant, but such loss is seen in several other dental conditions. Demineralization of the alveolar process may result in extensive resorption of the alveolus and associated inflammatory changes in the gingiva. Early loss of teeth is often seen in persons with hyperparathyroidism. Many patients with this disease consult dentists because of local oral conditions or because they may believe they have neuralgia or arthritis and request roentgenograms of their teeth. The presence of radiolucent regions in the jaws not associated with the teeth or diffuse demineralization of the alveolar process will suggest the presence of systemic disease. If this condition is associated with any of the listed symptoms, parathyroid disease should be suspected. In either instance, the patient should be referred for medical attention.

A case history is illustrated and described, in which dental consultation revealed an osteolytic process in the patient.

Diagnosis and therapy of severe infection in the region of the mouth and teeth

(Diagnose und gegenwärtige Auffassung der Behandlung der schweren Infektionen im Bereich des Mundes und der Zähne)

P. Cernea and J. Laufer. *Deut.Zahnärztebl.* 9:790 Nov. 8, 1955

Septicemia, a morbid condition caused by the presence of pathogenic bacteria and their associated poisons in the blood, often is accompanied by chills, profuse perspiration, irregular remittent fever and severe prostration. This disease is associated with other conditions such as phlegmon, thrombophlebitis, pyemia, osteitis and osteomyelitis.

For an early differential diagnosis, the evaluation of general and functional symptoms is important. The reaction of the human organism to specific causative microorganisms often is vague. Temperature of more than 40° C. or consistent temperatures of above 38° C. indicate the presence of parasites within the body. Other symptoms are sallowness, short and shallow breathing, rapid pulse but one difficult to detect, disturbances in the vegetative system, abnormal drowsiness, poor appetite and trismus. In addition, the patient is unable to identify or recognize sensory stimulations. These phenomena also are observable in diffuse osteitis accompanied by interosseous thrombophlebitis.

Two different basic forms of septicemia, each accompanied by gradual transition, must be differentiated:

1. Septicopyemia (septicemia and pyemia combined) begins as a paravenous infection and leads by an endothelial process to venous spasms combined with clot formation in the blood vessels. The type of infection and the resistance of the microorganisms determine whether this condition will be localized or become a more severe infection such as thrombophlebitis or septicopyemia.

2. Purulent inflammation of the submandibular gland or the region around the floor of the mouth (Ludwig's angina) is caused by a streptococcus infection, and usually begins with a paraalveolar swelling. Within one hour, it spreads to other regions. Paradoxically, almost complete painlessness and absence of fluctuation are signs of malignancy. In a few hours pallor, dyspnea, deglutition reflexes, hiccups, quickened pulse, oliguria leading to anuria, vomiting (of the projectile type), critical diarrhea, jaundice, hematuria and acute delirium can be observed.

Symptomatically, both forms of septicemia resemble other infectious conditions. Clinically, loss or dullness of consciousness, cardiovascular collapses, pulmonary edemas, albuminuria and hemorrhages can be noticed.

Etiologically, either an uncomplicated phlegmon of the neck or specific infection is the causative factor.

The center of septicemia seems to be located in the vegetative system, because in animal tests intravenous injections of small quantities of antibiotics produced no effect; however, when the same quantity was injected into the mesenteric gland, the resultant infection led to death.

During treatment, shocks occur frequently, and therefore the vegetative system should be anesthetized either by administration of hypnotics or by an artificial hibernation.

The disease progresses differently in adults and in children.

Therapy consists in administration of sulfonamides and antibiotics, penicillin (from 1 to 5 million units daily), streptomycin (1.5 Gm. daily), chlortetracycline, oxytetracycline, and tetracycline (from 1 to 3 Gm. daily), without waiting for the result of antibacteriolytic tests.

Favorable effects in the sympathic nerve center are obtained by medication with morphine, atropine and phenacetin derivatives.

Decalcification of endocrine origin

(Entkalkung endokrinen Ursprungs)

E. Cadenat and M. Bouyssou. *Zahnärztl.Praxis* Nov. 1, 1955

Recent research has established that dental decalcification, in the true meaning of this term, does not exist, at least not in a form similar to osteal demineralization. The assumption that an analogy exists between teeth and bones seems to be a fallacy. There may be resorption of bones from osteoclasis or rarefaction from osteolysis. The tooth also can be resorbed from osteoclasis (especially roots of deciduous teeth), but no rarefaction from odontolysis can occur. The diminution in density and weight but not in the volume of a tooth cannot take place normally.

Dental caries is an attack coming from the oral cavity, a decalcification from outside; therefore, caries is microchemical in origin. Even if the decalcification process from inside should occur, only the vital protein structure and not the mineral content will be involved.

Conditions which exemplify this fact are: multiple neurofibroma, osteitis fibrosa cystica and neoplastic arthritis deformans. In these diseases, the osseous structures become penetrable to roentgen rays, the already fully developed teeth remain uninjured, and only the incompletely developed deciduous teeth show hypercalcification.

Patients suffering from disturbances of the calcium metabolism exhibit no more dental caries than do others.

A seemingly similar condition often occurs during pregnancy. In several reports it has been assumed that a decalcification process in the teeth of pregnant women occurred. Statistical studies, however, disproved this conclusion by revealing that pregnant women do not show a higher caries frequency than others.

Even though in particular instances the old proverb: "every child costs one tooth of his mother" seems to hold true, the reason for the loss of teeth is not a decalcification process but an alteration in the oral cavity. It is possible, however, that such an alteration is influenced by pregnancy.

Diagnosis and treatment of oral actinomycosis: report of a case

L. H. Blumgart. *J.D.A. South Africa* 10:382-386 Nov. 15, 1955

In November 1954 the patient, a 13 year old European girl, noticed a small whitish swelling on the gingiva opposite the lower right first bicuspid. A dentist told her the tooth was abscessed, and it was extracted. The swelling, however, persisted and became larger and angry looking, although it was painless. The dentist lanced the swelling, but could express no pus. The girl was referred to a physician, and she was given a three day course of penicillin (600,000 units a day). No improvement was noted. Five weeks after the lesion had been noticed, the patient came to the author for examination.

There was a slight swelling on the right side of the face, and a large granulomatous mass on the right lower alveolar ridge extending from just distal to the lower right cuspid to just mesial of the lower second molar. The lesion was red and inflamed, and there were five or six tiny sinuses on the lingual and buccal aspects. The teeth were in good condition and the tongue, buccal mucosa and tonsils were normal. Palpation revealed no enlarged glands. The swelling was firm, and a white, dryish granular "tooth paste"-like pus could be expressed from the sinuses. There was pain on pressure. All the teeth responded normally to vitality tests.

A number of special tests were made; a culture disclosed the presence of *Actinomyces bovis.*

The differential diagnosis was fairly narrow. Results of the tests ruled out tuberculosis of the jaw and syphilis. Eosinophilic granuloma of the jaws was eliminated on the microscopic appearance. There remained the possibility of a chronic, nonspecific infection or an oral actinomycotic lesion. The latter was indicated by several factors: sinuses were present, the region of inflammation was spreading rapidly in spite of heavy antibiotic therapy, and there was no lymphadenopathy.

The treatment is described. The mode of infection in this instance was probably through some small abrasion of the gingiva, as the tooth was noncarious and vital. The patient said she had a habit of sucking grass, and she was from a rural district. This may not be significant as it has been established that the infection is not more common in rural than in urban areas. The fact that the diagnosis was missed for five weeks should remind dentists that instances of this disease do occur.

Erythema multiforme

I. B. Sneddon. *Med.Illust.* 9:689-692 Nov. 1955

Erythema multiforme (erythema exudativum) is an acute inflammatory eruption of polymorphic character that affects particularly symmetrical areas on the extensor aspects of the limbs. The eruption varies in appearance from erythematous blotches to target-like rings and even blisters, although only one type of lesion is present in each instance.

Involvement of the mucous membrane of the mouth is common. Here erythema is followed by a sudden white thickening of the mucosa that ulcerates and comes off in strips. The ulceration of the mouth may precede the skin eruption; in some recurrent instances, the mouth is more affected than the skin.

A particularly severe variety of the eruption is erythema multiforme major, rediscovered in 1922. The onset of the illness is sudden, with fever, malaise, headache and backache. The oral mucosa

becomes erythematous, swollen and painful and a pseudomembrane of desquamating epithelium is formed. The stomatitis spreads to the lips and may be so severe that feeding is difficult.

In the differential diagnosis, drug allergy must be considered, together with bullous diseases, pemphigus or a pemphigoid type, diphtheria, fusospirochetal infection, glandular fever and the oral changes of agranulocytosis.

Since erythema multiforme is a self-limiting disease with recovery usually in two to three weeks, treatment consists of relief of symptoms. The oral lesions are often the most troublesome to the patient and the usual alkaline gargles may not relieve the discomfort. Painting the ulcerated areas with a suspension of chlortetracycline 250 mg. in 10 ml. water often proves beneficial.

Treatment of erythema multiforme major is more complex because, although the disease subsides spontaneously, it has a definite mortality and morbidity. Antibiotics, preferably of the broad spectrum group such as chlortetracycline, should be given to control secondary infection of the mucosa and lungs. Recent reports on the use of ACTH are sufficiently encouraging to warrant its use.

▼ Psychology

Cooperation between dentist and psychotherapist

(Psychologisches in der Zusammenarbeit von Zahnarzt und Psychotherapeuten)

H. Meng. *Zahnärztl.Welt* 10:506-508
Oct. 25, 1955

Several dental organizations recently expressed their desire to be informed more accurately about the achievements of modern psychology, especially psychiatry and neurology, in the treatment of mentally and emotionally unbalanced and disturbed patients.

In his daily practice, the dentist should know the cause and consequence of abnormal behavior of patients before, during and after dental treatment. The dentist's diagnosis, too, will be influenced by a psychological understanding and by the knowledge that dental disease is no isolated phenomenon but a part of the comprehensive picture of the human body-soul organism. The diagnosis as an exact base for therapy must take into consideration not only dental pathology but anatomy, physiology, biology and etiology of the whole human organism.

The knowledge of the particular laws of psychology and its different branches in regard to the patient's conscious as well as his unconscious and subconscious existence, is as valuable in the office of the dentist as it is in that of the psychoanalyst.

In many instances, cooperation between dentist and psychotherapist is an absolute necessity.

An example is Georgi's (1949) report of a case. In an accident 25 years ago, a 20 year old man had sustained not only severe injuries of skull and collarbone, a triple fracture of the mandible accompanied by a fracture of the alveolar process in the right maxilla but, in addition, concussion and contusion of the brain. The cerebral injuries caused complete loss of consciousness and delirium which had lasted for several weeks. More than two decades after that accident, the results of the lack of cooperation between dentist and psychotherapist were still observable. It was not recognized that the mental as well as the physical disturbances were caused by the accident; they were treated separately and unsuccessfully. The patient was and is an invalid and unable to work. By his constant simulation and dissimulation and his abnormal fear of pain, he was able to deceive experienced neurologists. Combined observation by dentists, psychiatrists and neurologists, however, would have explained the patient's behavior and led to the correct diagnosis and therapy.

Dental focal infections often cause disturbances in the vegetative and hormonal system, producing, in addition to dental symptoms, abnormal tiredness, exhaustion, decrease in the capacity to work, febrile or subfebrile temperature, profuse perspiration, alterations in the blood-calcium metabolism, erythrocytes in the urine and vibrations in the musculature. Often, even after a successful treatment of focal infection by the dentist, the patient's secondary symptoms necessitate ad-

ditional treatment by either the internist or psychiatrist. Several types of neuroses have been reported as direct or indirect sequels of dental focal infection.

The diagnosis of "neurosis" will be verified by the patient's case history and the observation of his abnormal mental condition and of the anatomic and biologic changes in the involved structures. The psychophysical complex develops differently in children, men and women, according to the individual character and temperament. The experience in psychoanalysis often shows how fear and memory of long past dental treatments are deeply rooted in the patient's subconscious, leading to a symbol complex. Many dysfunctions are either caused or influenced by past mental disturbances.

Only when the dentist, in cooperation with the psychotherapist, is able to diagnose the psychology and physiology of pain and its reaction, will he be able to determine whether the patient's reactions can be brought to normal by therapeutic procedures or whether additional treatment by a psychotherapist will be necessary.

Anodontia: a psychological factor
(Psychologie des Zahnmangels)

E. S. Priester, Johannesburg, South Africa.
Zahnärztl.Welt 10:526-528 Oct. 1955

Senile anodontia and anodontia vera not only are somatic deficiencies which restrict proper mastication but often cause severe psychological disturbances. Patients afflicted with congenital anodontia usually show typical facies resembling that of congenital syphilis—a saddle nose, bulging frontal prominences and pointed ears. Their skin is abnormally soft, thin and dry, and their hair is sparse. In instances of anodontia, the condition of the oral mucosa has received little attention in dental literature.

In art, especially in painting and sculpture, persons pictured with a toothless mouth usually express something hideous or villainous; for example, there are ugly gossiping women, monsters, devils and witches. When persons are portrayed with many or all anterior teeth missing, the viewer receives the impression of something childish.

Prejudice is often felt against edentulous persons. Patients afflicted with anodontia usually have great disadvantages in their occupations and in society.

The influence of anodontia or edentulousness on the personality of the afflicted patient is of greater importance. Not only is swallowing of food difficult but sooner or later he imagines that people do not want to look at him and that nobody likes him. In time, he will develop an inferiority complex. He will avoid looking into a mirror because he abhors his own appearance. He becomes completely isolated and takes no part in social activities. This may develop into a kind of self-imprisonment and often will end in a "prison complex."

Variations in the psychological effects occur according to the sex of the patients afflicted. Women instinctively know that their teeth are part of their sexual attractiveness, and without teeth they feel undesirable. Edentulous men often tend to sexual inferiority and erotic impotence.

There are people, however, who show no psychological reactions to anodontia or edentulousness. They may walk about with empty mouths for years without being bothered by their appearance and its effect on society. Often they eat soft food only or, in some instances, the gums become hardened so that they are able to squeeze the food to pieces without proper mastication. They think that artificial dentures are a luxury which they cannot afford.

In edentulous children, differences in mentality between them and normal children often have been observed. The alveolar process may or may not be normal in development.

The importance of anodontia and edentulousness as a psychological factor decreases when the patient matures and learns to live with his affliction. Usually, patients with anodontia have a normal life expectancy.

The George Eastman Institute in Paris, France

Preventive and public health dentistry

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Public health dentistry

The George Eastman Institute in Paris, France

(Das George-Eastman-Institut in Paris)

Paul Schlieter. *Zahnärztl.Mitt.* 44:55-56 Jan. 15, 1956

The establishment of the George Eastman Institute in Paris, France, was made possible by a grant of $1,000,000 from the George Eastman Foundation. The Institute was opened in 1938, and now serves as a pedodontic and orthodontic clinic. School children between the ages of 6 and 14 receive dental treatment.

Other George Eastman Institutes are in Rochester, N. Y., London, Stockholm and Brussels.

The Paris Institute is located in one of the most beautiful parts of the city, surrounded by gardens. Its main building is simple in style but impressive in its large scale.

At present, the Institute consists of three departments: (1) the preventive division (55 dental chairs); (2) the orthodontic and pedodontic division (ten dental chairs), and (3) the oral surgery division (22 beds and several additional rooms with six beds each).

The Institute has a large library and an auditorium in which from eight to ten courses are given yearly to about 100 dental students. These courses cover orthodontics, pedodontics, public health dentistry, dental pathology, clinical dentistry and oral surgery.

Every year, the Institute provides dental care for about 800 school children.

The maintenance of the George Eastman Institute is secured by voluntary contributions of parents in the higher income groups and by monthly payments of costs from the Securitée Sociale, the only obligatory French hospitalization insurance program. These payments are

stipulated by contracts between the Institute and the Securitée Sociale.

All the school children of Paris are examined twice a year by public school dentists. When dental treatment is indicated, the children are brought to the different divisions of the George Eastman Institute by school bus (owned by the Institute) and returned to their schools or residences in the same manner.

Children who arrive by school bus are treated from 9 to 11 A.M. and from 2 to 4 P.M. Other children, accompanied by their parents, are treated from 11 to 12 A.M. and from 4 to 5 P.M. In the orthodontic division, preschool children also are treated.

The Institute has its own roentgenologic department and a large dental laboratory.

Dental caries control manual

J.Tennessee D.A. 36:3-34 Jan. 1956

The division of dental health of the Tennessee Department of Public Health has announced that services of its dental bacteriology laboratory are available to citizens of the state through requests by members of the dental profession. The services include bacterial tests concerned with the organisms of the oral flora and the activity of the organisms as demonstrated by caries activity testing procedures. The laboratory will perform the Snyder colorimetric tube test as a laboratory diagnostic aid in the determination of caries activity. The dentist may also obtain a lactobacillus plate count service for those patients who are placed on a low carbohydrate diet for the control of dental caries.

The Snyder test may be used as a screening test for all dental patients. It should aid the dentist in securing the patient's cooperation in the required course of treatment and in the maintenance of good oral hygiene. The Snyder test is a colorimetric tube test which attempts to measure the total acidogenic flora of the saliva. This test has a high correlation with clinical activity and with the lactobacillus plate count which is often used as a common comparative standard for all caries activity tests. The Snyder test is too insensitive for use in following the progress of a patient placed on a low carbohydrate diet; for the latter, the lactobacillus plate count is offered. This is a bacteriologic examination of the saliva in which the lactobacillus organisms are grown; the quantity is reported in numbers of lactobacilli per milliliter of saliva. Accumulated evidence shows that the lactobacillus count is closely associated with the progress of the disease of dental caries.

The division of public health also offers a low carbohydrate dietary plan as both a therapeutic and preventive procedure for selected patients. The suggested diets are based on the theory that the lactobacilli organisms of the mouth can be controlled or reduced through a diet low in refined sugars and total carbohydrate content. The suggested dietary regime covers a period of six weeks divided into three phases. The diet is ordinarily recommended for individuals with lactobacillus counts of 10,000 or higher. Listed are dietary plans for the following age groups: children ages 4 to 6; children ages 7 to 9; girls and boys, ages 10 to 12; girls ages 13 to 20; boys ages 13 to 15; boys ages 16 to 20, and adults. An appendix contains recipes for salad dressings and gelatine desserts, a dietary history chart, a chart of recommended dietary allowances, and a chart showing the hidden sugars in various foods. The dietary manual was prepared by the Tennessee Department of Public Health.

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Caries etiology and control

Fluorine and dental caries

(Fluor y caries dental)

Luis Blanco Florez. *Rev.españ.estomat.* 3:399-407 Sept.-Oct. 1955

Investigations into the relationship between fluorine and dental caries have lately been centered around three points of major importance: (1) the value of fluoridating water supplies up to a limit of 1.4 ppm as a preventive against decay; (2) the topical application of fluorine compounds for the same purpose, and (3) reduction of the fluorine content in highly

fluoridated waters to from 1 to 1.4 ppm in order to prevent mottling of the teeth. The addition of fluorine to dentifrices or its administration in the form of tablets, pills, and so forth, not only seems to have no positive importance at the present time, but also carries the risk of overdosage.

Many investigators have reported a reduced incidence of dental decay in places where fluorine is found in the water. From the facts presented, it seems certain that the most beneficial concentration is about 1.2 or 1.4 ppm, because, although none of the properties of the water is changed with a concentration of this degree, it affords the maximum protection against decay without the risk of mottling.

Various theories have been advanced to explain the effectiveness of fluorine in preventing decay; notably, an increase in the hardness of the enamel; the inhibition of bacterial and enzymatic processes, and the reduction of acidophilic flora in the saliva. Undoubtedly, each of these factors contributes to the result, and all three should be taken together. It must also be remembered that the teeth are living structures, subject throughout life to the hormonal, nervous, and circulatory regulation of the individual. Whatever the mechanism of its action, there is ample evidence to show that fluorine is an excellent prophylactic against dental decay. The cost of fluoridating public water supplies is trifling by comparison with that of dental care.

The topical application of fluorine is unquestionably effective when carefully practiced, but it is more or less expensive and therefore limited to small groups of the population. When it is used, precautions should be taken to keep the solution, preferably one of 2 per cent sodium fluoride with a pH of 4, from touching the soft tissues, because it may lead to the formation of small necrotic areas. If any of the solution touches the gingiva, it may be painted with a saturated solution of sodium gluconate. Petroleum jelly or olive oil also may be applied to the gums before beginning the application of the fluorine.

Finally, mottling of the teeth, which appears when an excessive amount of fluorine is ingested either in food or, more often, in drinking water, may be prevented by suitable treatment of the water supplies, especially filtration through pulverized animal bone. Treatment by polishing may be effective in the early stages when the spots are small and superficial, but more advanced instances will require porcelain or acrylic crowns.

Saliva and serum investigations of children from a fluorine district

(Om salivundersökningar och serumanalyser på barn i ett fluordistrikt)

S.-E. Ericksson and F. Nordh.
Svensk tandläk.tskr. 48:303-324 Oct. 1955

The population of the Norrbyskär islands in Sweden forms a rather well-defined testing group for caries investigations. All wells on the islands were tested for fluorine content in 1945 and 1953, the values remaining at the same level for each well, ranging between 0.9 and 2.3 mg. fluoride (F) per liter for the various wells. Chemical and bacteriologic analyses are also available.

Forty school children between 7 and 14 years of age, born and raised on the islands, were examined and compared with the control group of 80 children from the town of Teg, selected to give the same age and sex distribution. Water in the town of Teg has a fluorine content of 0.4 mg. per liter.

The children were examined clinically; pH and buffer values for stimulated saliva were determined. Snyder tests were performed. Also, antistreptolysin titer and antistaphylolysin titer relations were investigated.

It was found that the Norrbyskär children have a lower caries activity than the Teg children: 14.5 per cent against 32.7 per cent decayed permanent teeth; 41.6 per cent against 49.1 per cent decayed deciduous teeth.

The Norrbyskär children have a higher frequency of calculus.

The pH and buffer values for stimulated saliva are somewhat higher for the Norrbyskär children.

The Norrbyskär children have, according to the Snyder test results, much lower activity than the Teg children (1 out of 40 with high caries activity, that is, positive reaction after 24 hours, as against 6 out of 40 with high caries activity) and much lower lactobacillus counts.

The percentage of low values for both the antistreptolysin titer and the antistaphylolysin titer for the Norrbyskär children is much lower than earlier published normal values of similar material from nonfluoride districts. This would signify that the frequency and degree of infections with beta-hemolytic streptococci and alpha-hemolysin productive staphylococci are lower in fluoride districts. This is interpreted as a result of the antienzymatic and perhaps antibacterial effectiveness of the fluorine ion.

Determination of the presence of caries in fissures

John Miller and Pamela Hobson. *Brit. D.J.* 100:15-18 Jan. 3, 1956

Because of its simplicity, the diagnosis of caries by means of a probe commends itself for surveys where the number of examinations excludes a more elaborate diagnostic method. The degree of caries which is revealed by a probe is influenced by the cleanliness of the mouth, the lighting available for examination, and the skill and concentration of the examiner. Jackson (1950) described a procedure for diagnosis of caries which reduced the variations in results between examiners. The routine suggested by Jackson is generally followed by the department of children's and preventive dentistry at the Turner Dental School, Manchester.

To study the problem of variation or agreement between examiners, 30 children were examined by three different examiners on two occasions a week apart. On the first occasion, the diagnoses were made using a standard probe; on the second occasion, the examiners used replaceable probe points. With the standard probe, there was agreement among all examiners on the total number of carious teeth in 24 patients; with the replaceable probe point, there was agreement concerning 27 of the 30 patients. The replaceable probe point offers a more reliable and reproducible form of probe diagnosis. Miller and Atkinson (1951) developed the replaceable machine-made points similar in point size and shape to a proprietary standard clinical probe.

The replaceable probe point was used to study the "sticky" fissure which has been employed as a standard of caries diagnosis. The "sticky" fissure is judged to be carious when a probe with light pressure sticks in the pit or fissure and requires a definite pull for removal.

In one experiment a series of lower molars was examined for caries by roentgenogram and by probe. The observations indicate that the probe "sticks" in a fissure before caries can be diagnosed roentgenographically. The roentgenogram rarely revealed occlusal caries before the caries was clinically obvious.

From clinical records in which the replaceable probe was used for diagnosis of caries in pits and fissures, the time between eruption and the onset of caries and the subsequent progress of caries was observed. The observations indicate that 70 per cent of the "sticky" fissures in newly erupted teeth are carious lesions. Most of the teeth which became carious within three and a half years of eruption became carious soon after eruption; the majority of these teeth required filling within the next 18 months; 111 of the 380 teeth which were diagnosed as "sticky," however, did not progress during the next three and a half years to require filling. The possibility of spontaneous arrest of caries in a fissure, though unlikely, may not be entirely excluded from the evaluation which suggests that the 111 teeth indicate a weakness of diagnosis by probe.

Dental caries experience of Montana students

Lura M. Odland, Louise Page and Stanley T. Dohrman. *J.Am.Dietet.A.* 31:1218-1222 Dec. 1955

Epidemiologic data are reported for two surveys with native-born and reared Montana students serving as subjects.

Entering freshman students at Montana State College in 1950 were examined. They had a mean of 13.4 DMF teeth with a mean DMF score of 15.2 for the 124 women and 12.0 for the 170 men. When the freshmen were classified according to the fluoride content of the home water supplies, a consistent decrease from 15.6 to 5.7 in mean

DMF scores was observed as the fluoride content of the home water supply increased from 0.0 to 1.7 ppm.

DMF scores for 15 year old boys and girls in Bozeman and Great Falls, with 0.0 and 0.9 ppm fluoride respectively in the water supplies, were 12.2 in the former and 6.3 in the latter. In the classifications of DMF teeth and DMF surfaces, as well as for the individual components of decayed or filled teeth, the Bozeman scores were consistently double those for the Great Falls area. In the studies of both freshmen and 15 year old students, the DMF scores of the girls were slightly higher than those of the boys.

Does dental caries occur in animals living in their native habitats?

(Gibt es Zahnfäule bei freilebenden Tieren?)

Albert Keil. *Kosmos* 8:371-353 Aug. 1955

Dental caries has been studied intensively in man and in experimental animals. Far too often a single principle has been used to explain the entire caries problem. Such an unscientific attitude can only lead to a renewal of frustrating polemics so common in literature.

Studies of the bacterial flora in experimental caries in rats reveal that when the surface structure of seemingly healthy molars contains about 60 per cent of streptococci, of which almost one half are acidogenic, caries develops. The conclusion has been reached that both lactobacilli and acidogenic streptococci are microorganisms of possible etiologic importance.

The Syrian hamster is the only animal in which the degradation of enamel matrix in caries has been identified histologically as being similar to caries in man.

Many reports, published in medical and dental literature and in the literature of natural history, claim that dental caries occurs in animals living in their native habitats. It has been alleged that caries has been found in rodents, hooved animals, rapacious animals, toothed whales and manatees. Only in apes, living in captivity, was there unquestionable evidence of caries.

In European and Australian rabbits not living in captivity, a caries frequency of about 1 per cent has been reported. These reports, however, have not been verified. In 7 per cent of the European domesticated rabbits, carious lesions have been observed.

The previous assumption that the unique discoloration on the teeth of the red deer is a caries symptom has been discarded because the signs of a typical decalcification or of the disintegration of enamel and dentin are missing. The caries-resembling symptom in red deer probably is caused by an incomplete dentin development.

The assumption that caries occurs in sperm whales or in other species of toothed whales cannot be verified. Apparently, the phenomena which appear are caused by as yet unidentified parasites that bore holes in the teeth of these whales. Suppuration then leads to a resorption of the tooth roots, and makes the false diagnosis of dental caries possible.

The destruction in the teeth of manatees, observed in the collection of the Dental Institute of the University of Berlin, was identified by W. D. Miller as being carious lesions. Later examinations, however, proved Miller's hypothesis to be erroneous.

In no species of carnivorous animals, living in its native habitat, has caries been detectable.

No conclusion can be made other than that dental caries does not and cannot occur in animals living in their native habitats.

Can dental caries be decreased by hyaluronidase?

(Snizuje hyaluronidasa kazivosr chrupu?)

Z. Antalovska. *Česk.stomat.* 2:42-48, 1955

Hyaluronidase is an enzyme occurring in pathogenic bacteria, leeches, sperms and in snake, spider and other venoms. Used for injection, it is a sterile, dry, soluble enzyme product prepared from mammalian testes and capable of hydrolyzing mucupolysaccharides of the hyaluronic acid type. In addition to a suitable stabilizer, each injection unit contains 0.25 microgram of tyrosine.

The value of hyaluronidase as a "spreading agent" to help diffusion and absorption of fluid accumulations caused by trauma has long been established. These effects are obtained through

its ability to decompose hyaluronic acid and to promote an invasion of microorganisms in cells and tissues.

At the Dental Institute of the University of Prague, Czechoslovakia, the localized effects of hyaluronidase on the hard tooth substances were examined *in vitro*. The effects of hyaluronidase were determined in pulverized enamel and dentin, water-diluted saliva and glucose, and dissolved calcium and phosphorus by either titration or photometry. When hyaluronidase is added to such a mixture, a positive or negative relation to the solubility of the tooth substances can be revealed (Fosdick's test). The results of the test proved that calcium and phosphorus contents decreased in relation to the increase of the hyaluronidase concentration. The solubility of the hard tooth substances decreased by localized applications of hyaluronidase.

According to the observations presented, hyaluronidase may impede the development of caries and decrease the caries frequency.

The relationship between hyaluronidase in the saliva and the carious process, however, could not be established by local applications. It is possible that the tests proved the prophylactic value of hyaluronidase in dental caries.

Fluorine intake through the enamel of human teeth after different storage periods

(Die Fluoraufnahme durch den Schmelz menschlicher Zähne nach verschiedenen Lagerungszeiten)

H. R. Mühlemann, J. C. Somogyi and G. G. Poretti. *Bul.schweiz.Akad.med.Wissensch.* 11:386-390, 1955

Reports published in dental and medical literature on fluorine intake through the intact enamel are inconsistent; therefore, new examinations with radioactive fluorides were necessary. These investigations were facilitated by the 31 MeV betatron which produces sufficient amounts of radioactive (potassium) fluorides.

Previous tests with rabbit teeth revealed a considerable fluorine uptake. After these animals were sacrificed, the upper jaws were dissected and the teeth, without being extracted, were preserved for one hour in an 18 per cent potassium fluorine solution containing also radioactive fluorides. The uptake of radioactive fluoride was measured through the mica windows of the Geiger-Müller counter.

Sixty-two teeth of children between the ages of 10 to 14 years, without macroscopically observable caries, were examined (45 upper and 6 lower first bicuspids; 2 upper and 3 lower second bicuspids; 1 lower and 2 upper incisors and 3 upper third molars). By carefully performed extraction, fissures in the enamel were avoided. After extraction, all the teeth were preserved in an isotonic saline solution. The fluorine content of this solution was not determined because obviously it was very low. All tooth roots were cleaned with pumice and covered with red wax and collodion varnish. The degree of purity of the teeth and the quality of the wax-collodion cover were tested with the binoscope. After such primary treatment, all teeth again were stored in the isotonic saline solution.

Group A (28 teeth) was treated after 12 hours with radioactive fluorides; group B (33 teeth) after from 3 to 9 days (from 72 to 216 hours).

These tests were executed with radioactive fluorine isotopes (18F), usually produced by irradiation of ^{18}O or ^{16}O in water by cyclotrons. The isotopes used in these tests, however, were produced by a gamma radiation of ^{19}F by the Brown-Vovery betatron.

The absorption of irradiated fluorine through the intact enamel was about six times higher in group A than in group B. The average value of the fluorine infiltration of teeth with a postextractional storage time of less than 12 hours was significantly greater than that of teeth stored for a period of and above 72 hours.

Dental caries

Queries and minor notes. *J.A.M.A.* 159:1335 Nov. 26, 1955

Sugar in concentrated forms should be removed from the diet of a child with severe tooth decay, but it is virtually impossible to eliminate all carbohydrates from the diet. An advisable diet for a caries-susceptible child should be free of jams,

jellies, candy, heavily sugared beverages, canned (sweetened) fruits, sweetened pastries, and canned peas or corn. Caries-susceptible persons should brush their teeth or at least rinse the mouth thoroughly after each meal.

Caries activity is higher among persons who spend more time eating, either by slow eating or frequent between-meal snacks. Food which sticks to the teeth causes greater caries activity.

Heredity plays a major role in dental caries but the "outbreeding" of dental caries is unlikely until man chooses a mate with the same care he exhibits in the purchase of horses or cattle. Dietary control has given the best clinical results in reducing caries.

▼ Nutrition

A nutrition officer's experiences visiting the southwest Pacific islands

Muriel E. Bell. *Nutrit.Rev.* 14:33-36 Feb. 1956

The author and Lucy Wills spent eight weeks in 1950 investigating the nutritional status of Fijians and Indians in Fiji, and Samoans in Western Samoa. The investigation centered around anemia, possible protein and vitamin deficiencies, and any nutritional clues that might account for the increased prevalence of dental caries among the people on some of these islands.

The Fijians lead a communal life in villages, living on dalo (taro), yam, tapioca, breadfruit, banana and coconut with occasionally some fish or land crabs. There are virtually no cows, few chickens are kept, and no maize is eaten.

No factor of nutritional significance emerged which might throw light on the recent tendency of the deciduous teeth of Fijians to decay. The four top incisors of the deciduous dentition were often structurally defective enough to lead to the early breakdown of the teeth, which then decayed down to the level of the gums by the second or third year. This seemed to point to some hypoplastic condition arising *in utero*. The secondary dentition then appeared to be well-formed.

The nutritional status of the aging

Agnes Fay Morgan. *Acad.Rev.* 4:17-25 Jan. 1956

A study of nearly 600 men and women over the age of 50, living in San Mateo County, was made to determine whether the nutritional status of people 50 years old and older is different from the nutritional status of younger people. Nutritional status refers to the state of the body so far as it can be ascertained by biochemical and other examinations with reference to the supply of nutrients. Among the many nutrients measured and examined were the amino acids, minerals, calcium, phosphorus, iron, magnesium and the vitamins.

Participation of those studied was obtained voluntarily. The subjects considered themselves healthy and had not consulted a physician for at least three months. The examination was made by a specially trained public health service physician. A diet record for seven days was kept by each subject. Blood samples were taken and biochemical determinations made. The mouth and teeth were examined.

It was found that the level of ascorbic acid in the blood is directly dependent on the immediate ascorbic acid intake in the diet. For good nutritional status each person requires a high level of ascorbic acid circulating in the blood, and this requires a daily allotment of ascorbic acid in the diet, that is, fresh fruits and vegetables.

The level of ascorbic acid in the blood of men at all ages was significantly lower than that of women, although the men had higher ascorbic acid intakes than women at every age. It was concluded that men, at least those over 50 years old, had a definitely higher requirement for ascorbic acid than women.

Of the approximately 600 men and women studied, 39 per cent were edentulous. Those who had no teeth or who had inflamed gums were for the most part those who had low serum ascorbic acid. Those with high levels of ascorbic acid in the blood were those who had more teeth and better gums. There was a significant correlation at the 1 per cent level between the edentulous condition, the gingivitis and the level of ascorbic acid in the blood. The level of ascorbic acid in the blood was likewise closely correlated with the

level of intake. It might be said that the amount of ascorbic acid in the diet influences in large groups of people the occurrence of the loss of teeth which in some instances is caused by periodontal difficulties.

When the persons studied were grouped by economic status, it was found that the people at the bottom of the economic ladder were those with low ascorbic acid levels and low intakes. At the top of the ladder everyone had high ascorbic acid intake, high ascorbic acid serum levels, teeth and good gums.

Dentists with older men and women as patients should make sure they realize the importance of an intake of ascorbic acid twice daily. This should come from a good diet containing fresh fruits and vegetables and perhaps also a tablet of ascorbic acid at each meal. The health of the mouth, especially in the view of the periodontist, is dependent to a considerable extent on plentiful ascorbic acid intake, especially so with men. The periodontist seeking to improve the diet of an elderly patient should look first to ascorbic acid, second to the quality and quantity of protein, and third to calcium.

Information on ascorbic acid is still needed

A. M. Hunt. *J.Ontario D.A.* 33:12-15 Jan. 1956

In the last 25 years great strides have been taken in defining the role of many of the essential nutrients. Recently, however, complacency has developed. Last year, 50 infants with clinically observable scurvy were admitted to the Hospital for Sick Children in Toronto. Although the dentist may have had little opportunity to observe these very young children in his practice, correct nutritional advice could have prevented some instances of the disease. The role of ascorbic acid should be known if the dentist is to carry out his responsibility of dispensing information about this nutrient.

Scurvy, a disease caused by deficiency of ascorbic acid, for centuries has plagued armies, navies and exploratory forces which consumed stored food. Backstrom in 1734 traced its etiology to a lack of fresh vegetables and greens.

Ascorbic acid is necessary for the normal activity of the odontoblasts which in turn are responsible for laying down the predentin, the matrix in which calcification of dentin takes place. As shown in experimental severe scurvy in guinea pigs, the defect appears to be in the cell itself and not in the calcification mechanism because new odontoblasts fail to differentiate from the mesenchyme at the growing end of the continually growing teeth. Older odontoblasts slow down and then cease to produce matrix. Previously deposited predentin becomes heavily calcified. Osteoblasts, the cells concerned with the formation of bones, are affected similarly.

Crandon, Lund and Dill induced clinical scurvy in human volunteers in 161 days. The syndrome included a moderate loss of weight, perifollicular petechiale, extreme fatigue and failure of experimental wounds to heal. The scurvy cleared up immediately on administration of ascorbic acid.

In monkeys suffering from severe scurvy, gingival hemorrhage occurs. Lind showed that hemorrhage and sloughing of teeth were prominent features of severe scurvy. Gingival hemorrhage is a very late manifestation of the disease. Glickman has shown that hemorrhage occurs only when teeth are present and when there is additional mechanical injury. Ascorbic acid used as a therapeutic agent for gingivitis has little chance of effecting a cure unless a deficiency exists.

Citrus fruits, tomatoes and green leafy vegetables are the best sources of ascorbic acid. Any of the following will satisfy the daily requirements: one medium orange, four ounces of frozen orange juice, four ounces of canned grapefruit juice, eight ounces of tomato juice, or two ounces of raw cabbage. Potatoes are important sources of the vitamin.

Nutrition and the tooth

Henry M. Leicester. *J.A.D.A.* 52:284-289 March 1956

The relation of nutrition to the individual tooth has entered a new phase of investigation. Now being studied are the detailed effects of factors which have previously been given only a general consideration.

In considering the effect of nutrition on the tooth, a sharp distinction must be made between the developing and the fully formed structures. During its formative stage, the tooth is one of the most sensitive organs in the body to systemic influence; once the tooth has formed and erupted, it becomes one of the least sensitive organs to systemic conditions.

Adequate nutritional status must be maintained while a tooth is forming. The erupted tooth cannot be altered by systemic changes; only physiochemical or chemical changes can alter it.

A deficiency of vitamin A in the diet results in a disturbance of the keratin matrix of enamel. A vitamin C deficiency causes a similar disturbance of the collagen matrix of dentin. Lack of vitamin D results in poor calcification. Deficiency of dietary magnesium can cause a specific type of hypoplasia. The presence of excess fluoride in the diet interferes with enamel formation, resulting in mottled enamel.

The mottling effect of excess fluoride is somewhat dependent on nutritional status. With a calcium deficiency in the diet, a lower concentration of fluoride will produce the same amount of mottling as that produced by a larger intake of fluoride in a well-nourished person. Deficiency of dietary protein or high dietary fat may also enhance the toxic effect of fluoride.

Sognnaes has shown that if the mother ingests high quantities of carbohydrates during pregnancy, the offspring later will be more subject to caries resulting from a diet high in sugar than would be true if the mother had received little carbohydrate.

The addition of calcium to the diet at weaning retards development of caries when cariogenic rations are fed, providing tooth development is not complete, whereas decreasing dietary calcium at this time results in more caries. Better nutrition during the formation of first molars results in fewer pits in these teeth.

Small nutritional changes probably are more important for the health of the mature tooth than has ever been suspected.

Two major harmful changes which may occur in a mature tooth are erosion and caries. Erosion is caused almost entirely by acids on the tooth surfaces. These acids may come from sucking citrus fruits or acid candies, or from excessive drinking of acid beverages. The problem of erosion is less serious than it might be because saliva has a neutralizing action on acids in the mouth.

From a nutritional standpoint, the vital role in caries etiology is played by carbohydrates. The form of the carbohydrate and the materials with which it is mixed are important.

Among widespread misconceptions regarding the relation of diet to the health of the teeth is the idea that caries can be reduced by feeding diets rich in calcium after the teeth have formed. There is no possibility of such calcium getting into the enamel or altering in any way the carious attack.

None of the vitamins has any direct effect on caries, however important it may have been in tooth formation. A diet rich in sugars from fruits, honey or other "natural" sources is as cariogenic as one rich in refined sucrose.

The form and the fluidity of carbohydrate-containing material are important. If a considerable amount of fats is present along with the sugar in the diet, less caries results. When sugar is dissolved in water or water is added to a diet containing sugar, less caries results than from the same amount of dry sugar. Further nutritional studies may eliminate many older ideas whose validity cannot be established by rigorous, controlled investigation.

Doctoral and Masters' dissertations

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In this column each month are listed recent Doctoral and Masters' dissertations of dental interest, accepted by the dental schools or graduate schools in partial fulfillment for advanced degrees. Copies of many of these theses are available from the schools through interlibrary loan.

An impression technique for an immediate maxillary denture. *Wayne F. Korchoff. 1954.* M.S. *State University of Iowa.*

Surgical procedures for mandibular lingual anomalies. *Richard J. Lynch. 1955.* M.S. *State University of Iowa.*

Processing acrylic denture. *Thaxter Miller. 1954.* M.S. *State University of Iowa.*

A longitudinal study of changes in a mandibular bimolar diameter before and after eruption. *George E. Mindeman. 1955.* M.S. *State University of Iowa.*

The comparative effects of contemporary local anesthetics on pulse character and rate. *Graham Overby Davies. 1954.* M.S.D. *Northwestern University.*

A study of the reparative powers of the mature dental pulp following partial amputation as a treatment for exposure by dental caries. *Gilbert I. Brinsden. 1955.* M.S.D. *Northwestern University.*

A cephalometric radiographic evaluation of growth of the face during orthodontic treatment in adolescent males. *Milford Franks, Jr. 1955.* M.S.D. *Northwestern University.*

A radiographic investigation of the temporomandibular joint in Class III malocclusion. *Francis John Furlong. 1955.* M.S.D. *Northwestern University.*

A radiographic and clinical investigation of various movements of the mandible. *Elizabeth June Zwemer. 1954.* M.S.D. *Northwestern University.*

An electromyographic study of the temporal and masseter muscles in cleft palate patients with insufficient maxillary development. *Thomas John Zwemer. 1954.* M.S.D. *Northwestern University.*

Piacryl SH as material for lining or repair of artificial dentures. *Walter Döppe.* 1953. DR.MED. DENT. *Martin Luther Universität, Halle, Germany.*

Etiology of anomalies of the jaws in children (from 9 to 11 years): the thumbsucking habit. *Hans Schmidt.* 1953. DR.MED.DENT. *Martin Luther Universität, Halle, Germany.*

The use of acrylic resin in the construction of artificial dentures: the surface tension of Piacryl. *Karl Heinz Zorowka.* 1953. DR.MED.DENT. *Martin Luther Universität, Halle, Germany.*

Mühlemann's "Propulsor": its application in instances of Angle's Class II, division 1 malocclusion. *Armin Reuter.* 1953. DR.MED.DENT. *Martin Luther Universität, Halle, Germany.*

Anticarious effects of alkaline salts. *Hans Joachim Meyer.* 1953. DR.MED.DENT. *Martin Luther Universität, Halle, Germany.*

Grinding and drilling: the diamond hollow grinder, its utilization in pedodontics and a comparison with the wolfram carbide drill (Schleifen und Bohren: unter besonderer Berücksichtigung des Diamanthohlschleifers, seiner Anwendung in der Schulzahnklinik und seines Vergleichs zum Wolframkarbidbohrer). *Rudolf Jupitz. 1953.* DR. MED.DENT. *University of Bonn, Germany.*

The caries problem in polariscopic analysis: investigation of organic substances of normal and pathologic dentin structures (Das Kariesproblem in der polarisations-optischen Analyse: Untersuchung der organischen Substanz normaler und pathologischer Dentinstruktures). *Karl Werner Pappenheimer. 1953.* DR.MED.DENT. *University of Bonn, Germany.*

Experimental investigations of the toxicity of several local anesthetics (Experimentelle Untersuchungen über die Toxizität einiger Lokalanästhetica). *Hermy Gamm. 1954.* DR.MED.DENT. *University of Kiel, Germany.*

The intensity of adhesion to the dentin of self-curing acrylic resins and other dental materials (Über die Haftintensität schnellhärtender Kunststoffe und anderer Materialien auf Dentin). *Ulrich Haempel. 1954.* DR.MED.DENT. *University of Kiel, Germany.*

Localized treatment of inflammatory processes in the oral cavity (Über die lokale Behandlung entzündlicher Prozesse der Mundhöhle). *Engelbert Schaffer. 1953.* DR.MED.DENT. *University of Mainz, Germany.*

The behavior of bacteria during their transfer from a suspensoid to an aerosol form (Über das Verhalten der Bakterien beim Übergang von der Suspensions- in die Aerosolform). *Afred Wehner. 1953.* DR.MED.DENT. *University of Mainz, Germany.*

Therapy of caries in deciduous teeth (Terapia della carie nei denti decidui). *Carlo La Rocca. 1953.* DR.MED. & CHIR.ODONT. *University of Padua, Italy.*

Ultrasonic therapy in apical granulomas (Terapia ultrasonica dei granulomi apicali). *Giuseppe Bergamini. 1953.* DR.MED. & CHIR.ODONT. *University of Padua, Italy.*

Removable partial dentures (Protesi ammortizzate). *Contardo Magenta. 1953.* DR.MED. & CHIR. ODONT. *University of Padua, Italy.*

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